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Lathe Attachment for Centering and Squaring.

The importance of well-prepared centers for a successful lathe job has been noticed in previous numbers of the SCIENTIFIC AMERICAN. We here illustrate a simple device for this purpose, which is used and highly recommended by some of our best mechanics. Ordinarily, several manipulations are required before shafts or studs are ready for turning. This machine, by one movement, centers, drills, countersinks and faces the work in the time required by the old method for each of those operations. The work is done accurately, and the machine can be managed by a boy or common workman. It adjusts itself to any size, without any alteration; is equally adapted to round, square or flat bars; cuts them to a uniform length, if required, with or without centers, and mills the ends for screws. It can be applied to any engine or drilling lathe, and attached or detached as readily as the foot-stock. The advantages claimed by its inventor are: simplicity and durability of construction, ease of management, saving in time, labor and power, and that work otherwise disagreeable is made pleasant.

Fig. 1 gives a perspective view of the attachment, showing the sliding jaws, N O. for holding the work firmly and centrally to the drill and cutters, by means

Fig. 1

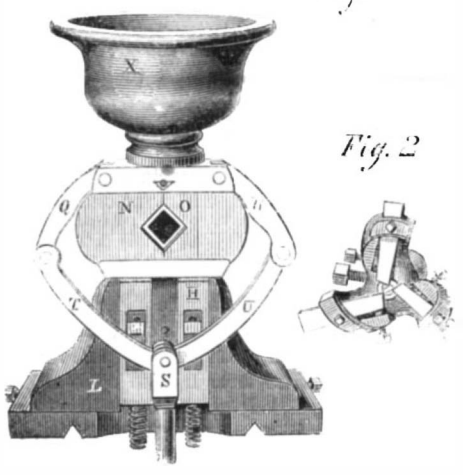


Fig. 2

of the levers, R T, connected by the rod, S, to a treadle beneath the lathe, operated by the foot. The part, H, is adjusted perpendicularly, and the chocks, L, horizontally, by set screws.

Fig. 2 shows the cutter and drill-holder, which is attached to the rotating spindle.

Fig. 3 is a fac simile of the attachment at work, as placed on a drilling lathe. For some time past one of them has been doing all the centering and squaring in the extensive machine works of Messrs. P. Whitin & Son, Whitinsville, Mass.

The operation will be readily understood by mechanics. The parts, X, are convenient arrangements for applying and saving oil.

For machines, State rights, the entire right, or further information, address the patentee, N. F. Newell, Whitinsville, Worcester Co., Mass., care of P. Whitin & Sons. Date of patent Jan. 29, 1861. See advertisement in next issue.

THE ironclads in the James river have been provided with a large sized locomotive lantern, which is placed on the bow. Its rays thrown ahead on the water enable the men to see if the rebels send down infernal machines, or make any attempt to board them.

Reclamation.

In a recent number of the SCIENTIFIC AMERICAN it was stated that Prof. Tyndall, in a late lecture before the Royal Institution, had attributed to Mr. Joule the discovery of the disturbance of molecular forces by magnetism, when, in fact, the discovery was made and published in *Silliman's Journal*, by Prof. Chas. G. Page, of Washington, several years before the experiments of Mr. Joule. Turning to Prof. Tyndall's book of lectures on "Heat as a mode of motion," page 117, we find him chargeable with another anachronism, more decidedly erroneous, in the record of scientific discoveries. The discovery of the vibration of "Trevelyans' bars," by Galvanism, and also the continuous rolling of metallic cylinders upon rails by the same agency, is ascribed by Prof. Tyndall to George Gore, Esq. Mr. Gore first made his experiments before the Royal Society, June 3d, 1858, and published the same in the *Philosophical Magazine* for June, 1858. More than eight years before, this same discovery was announced by Prof. Page in *Silliman's Journal* for January, 1850, together with illustrations of some interesting applications in the way of the *physique amusante* growing out of this discovery.

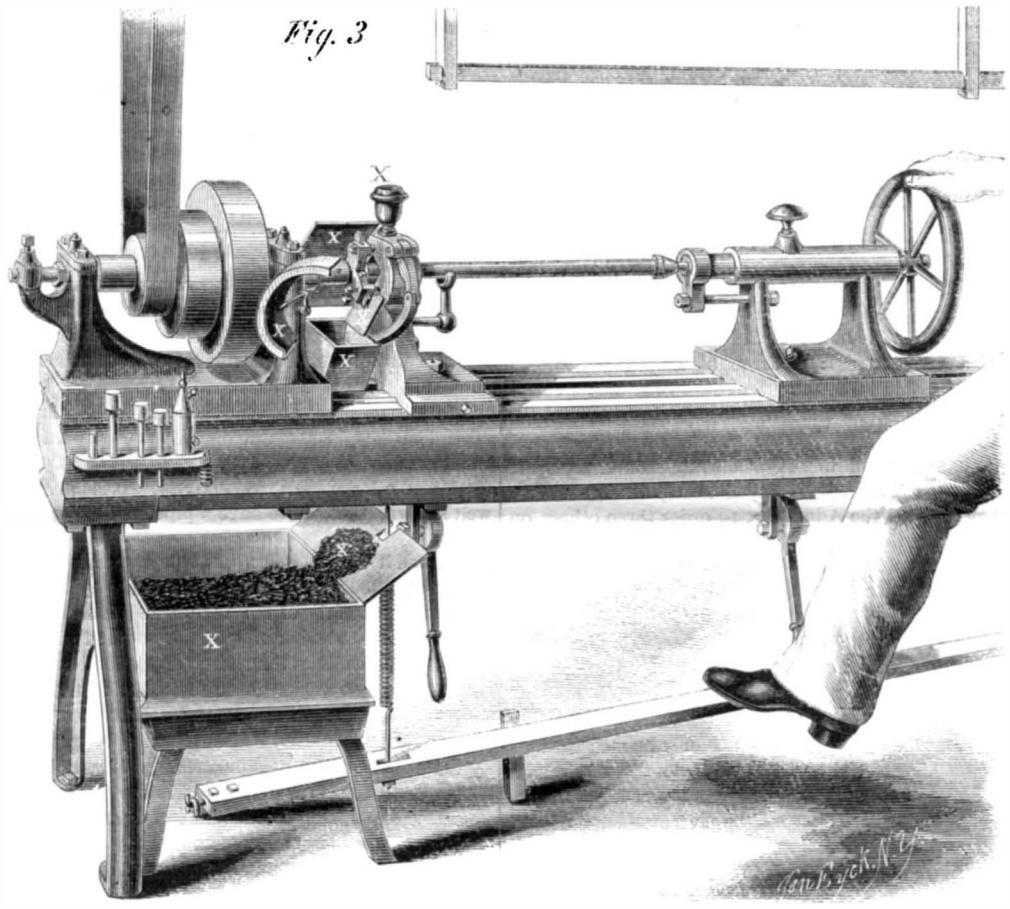
What may be sent to Prisoners of War by their Friends.

The United States will forward to its prisoners of war in the South the following articles:—Uniform hats, uniform caps, uniform coats, uniform jackets, flannel shirts, drawers, bootees, stockings, blankets (woolen), blankets (gum), commissary stores. The friends of the United States prisoners of war confined in the South are permitted to forward to them, by flag truce boat or other authorized channel, the following articles:—Coats, underclothes, caps, suspenders, brushes, buttons, sewing cotton, pocket knives, steel pens, postage stamps, pipes, sirups, lard, bologna sausage, pepper, pants, socks, shoes, looking-glasses, combs, tape, pins and needles, paper, lead pencils, tobacco, snuff, family soap, smoked beef, corn meal, mustard, vests, hats, handkerchiefs, towels, clothes, brooms, thread, scissors, envelopes, pen knives, cigars, crushed sugar, butter, beef tongues, nutmegs, table salt, salt fish, pickles, dried fruit, apples, crockery, crackers, sauces, lemons, matches, glass ware, cheese, vegetables, nuts, yeast, powder, tinware, meats and fish in cans.

All articles for prisoners of war will be forwarded to Col. John E. Mulford, agent for exchange of prisoners of war at Fortress Monroe, Va.

By order of the SECRETARY OF WAR.
E. D. TOWNSEND, Assistant Adjutant General.

Fig. 3



NEWELL'S LATHE ATTACHMENT FOR CENTERING AND SQUARING.

NOTICE TO SUBSCRIBERS.

Hereafter, until further notice, the price of the SCIENTIFIC AMERICAN will be as follows:—When sent by mail, $3 per annum; $1 50 for six months; $1 for four months. When delivered in the city by carriers, $4 per annum. Single copies at the publication office and at periodical stores, 8 cents each. The postage on the paper by mail is 20 cents a year, payable quarterly in advance at the post office where received.

SCENTED SMOKING TOBACCO.—Cascarilla bark imparts a pleasant odor to tobacco. The scent is like musk, and is to be preferred to the rank and bitter fumes of common tobacco. With cascarilla bark in it a pipe may be smoked in any apartment without offense. A piece as big as a pea is enough to put in one pipe full, but manufacturers grind the bark and mix it with the tobacco.

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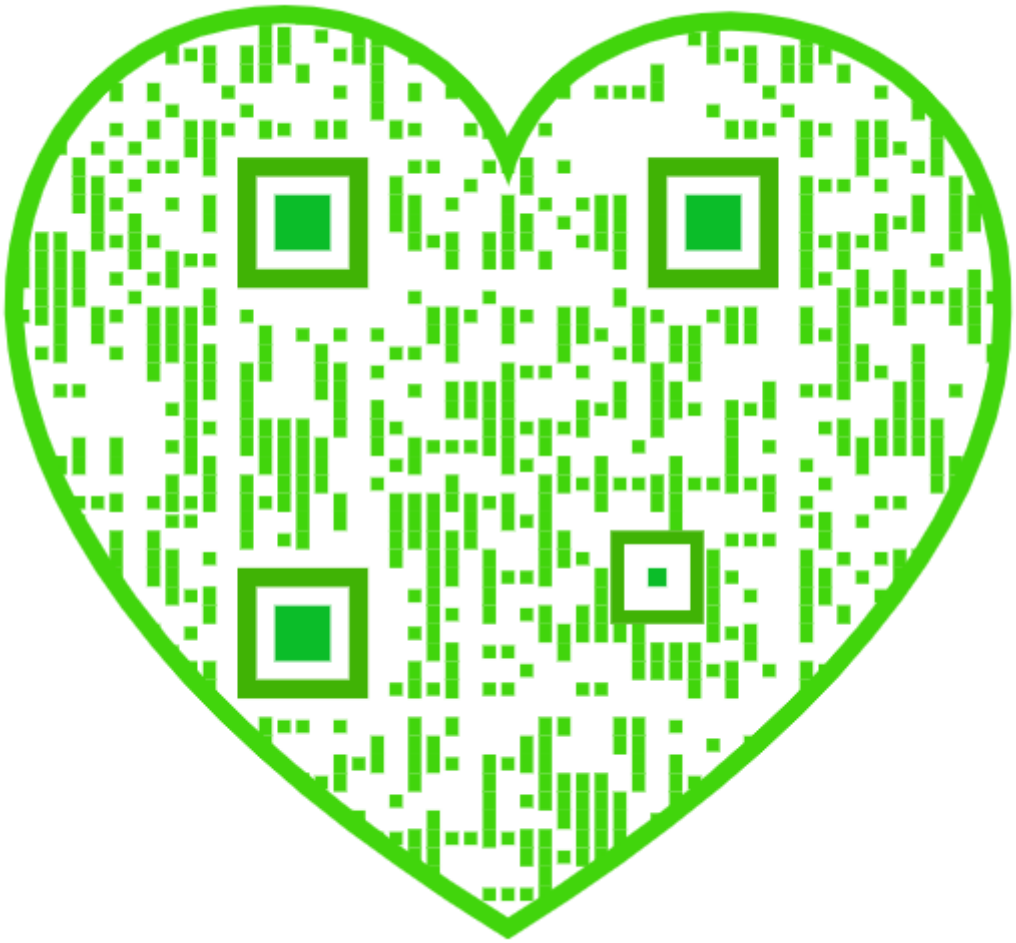

FAILURE OF THE ENGLISH IRON-CLADS.

The following article appears as a leader in the London *Mechanics' Magazine*, the best mechanical paper, with the soundest engineering views, published abroad:—

"The event foreshadowed in the *Mechanics' Magazine* more than two years since, is close at hand. The fleet of experimental iron-clads, of which the *Warrior* is the type, must, if they are to be in a condition to cope with the armor-plated ships of foreign powers, be reconstructed. What a bitter sarcasm is this announcement on Admiralty management. The *Warrior* has been held up to the admiration of the naval world as the most perfect specimen of a screw iron-clad frigate. Quite recently, it was represented on Whitehall authority, that 'her excellent sea-going qualities and rate of speed under steam were unrivalled,' and she was 'just in such splendid order in all her internal arrangements as can only be attained by unremitting exertions at the close of an ordinary term of commission.' It seems incredible that this magnificent vessel, which, we are told, the Admiralty officials 'feel a just pride in calling the finest and fastest of her Majesty's iron-clad fleet,' is suddenly discovered to be utterly defenseless as a ship of war.

"We were prepared for this discovery. Whilst she was still under construction we pointed out that the unprotected condition of her bows and stern would be fatal to her in action, as it would enable a completely armored antagonist to make a wreck of her two ends, and in her crippled state leave her no choice but destruction or surrender. Representations to that effect were urged on the notice of the Admiralty but disregarded with sublime indifference by 'my Lords' and their noble secretary. Remonstrance was in vain; the square fighting-box, occupying 200 feet in length of the center of the ship, was a capital invention. The batteries and the gunners were safe in this iron fortress: the arrangement was perfection, nothing could be better. The Controller and his staff were jubilant; they treated with disdain the sinister predictions of professional and civilian critics, and not content with one experimental iron-clad on the fighting-box system, costing nearly half a million, they induced the Admiralty to order three others on the same principle. Four ships, at a cost of nearly a million and a half; were built on an untried plan, and now, after their completion, by a trial, which might and ought to have been made long before the first of the number was ready for sea, it is discovered that the objectors, whose opinions were treated with scorn, are right, and the plan is a failure.

The recent shell practice against the target-ship *Alfred*, at Portsmouth, has suddenly opened the eyes of the 'Lords,' who witnessed it, to the unpleasant fact that a *Warrior* with her bows and stern unprotected by iron armor would be no match for a *Gloire*, much less for a *Couronne* or a *Magenta*.

"A panic has seized the Controller of the Navy and his Chief Constructor, and spread to the Board. The fear of Parliament is before their eyes. Hastily, 'the *Warrior* is to be paid out of commission, and is ordered to be thoroughly dismantled, everything being returned to store and her machinery taken to pieces.' Three reasons are spoken of as having influenced the Admiralty in paying her out of commission:—'First, want of men for the three-decker *Victoria*; secondly, the defective condition of the ship's boilers; and, thirdly, the *intended alterations and continuation of the armor-plating around the bows and stern*." The first two reasons are mere pretexts —the last is the true one. At length the murder is out. The famous *Warrior*, the splendid iron-clad, cannot meet an enemy without being doomed to destruction and without disgracing England's flag. The remedy is a bitter pill for the Government to swallow; but there is no avoiding it. *The Warrior must be reconstructed*; and this will commence the reconstruction of our entire iron-clad navy. The *Warrior* or elastic system of armor plating—iron on wood backing—which, with slight modification, is adopted for every plated ship, as we have frequently shown, is defective in principle, and must be replaced by a system of greater rigidity. The expense will be enormous, but it is unavoidable.

"The intended alteration to the *Warrior's* bow and stern will necessitate the opening and lengthening of the ship's frame forward and aft, otherwise she would be unable to carry the additional armor plating, and would be ruined in her present excellent sea-going qualities and speed. In plain words, it is found necessary to cut the *Warrior* into three parts and reunite them by splicing (to use a familiar term) at both ends. This work will necessitate the removal of the armor plates and backing at the two extremities of the ship, the reconstruction and replating of the latter, and probably alterations in the masting and rigging. These changes will involve great expense, and may be seriously prejudicial to the trim of the vessel. Three other iron-clads on the same plan will have to be reconstructed.

"But worse still remains to be told. What is to be done with Mr. Reed's fleet of wooden bottoms and unprotected ends, carrying square iron fighting boxes on the *Warrior* plan, but with such instability of structure that the iron top sides vibrate alarmingly from the fire of the ship's guns, with armor that will hardly resist 68-pounders at short ranges, and with the hamper of movable bulkheads on deck? If the formidable *Warrior* cannot encounter an enemy without being reconstructed, what is to become of the ships of the *Research* and *Enterprise* class, of which eight were built or laid on the stocks before one was tried? They have neither strength nor speed, are neither liners nor cruisers, and cannot by any process of reconstruction be converted into serviceable craft. With these prospects before us, the condition of the navy is by no means satisfactory."

FURTHER EXTRACTS FROM PROFESSOR TREADWELL ON HOOPED CANNON.

[Concluded from page 389.]

EFFECT OF LIGHT AND HEAVY SHOT.

In artillery practice, the restraining power which causes the powder to act against the walls of the cannon is derived principally from the inertia of the shot. This is so much greater than the inertia of the powder itself, that the latter may be neglected in the considerations that are to follow. Now, bearing in mind what has been already said, let us compare the difference of the force of powder as exerted upon a small and a large gun respectively. It is perfectly well known, that, if we have a pipe or hollow cylinder of say two inches in diameter with walls an inch thick, and if this cylinder will bear a pressure from within of 1,000 pounds per inch, another cylinder, of the same material, of ten inches in diameter, will bear the same number of pounds to the inch if we increase the walls in the same proportion, or make them five inches thick. A cross-section of these cylinders will present an area proportional to the squares of their diameters, and if the pressure be produced by the weight of plungers or pistons, as in the hydrostatic press, the weight required in the pistons will be as the squares of the diameters, or as 4 to 100.

Now carry this to two cannon of different calibers, and take an extreme case. Suppose the caliber of one to be 2 inches in diameter and the other 10 inches, and that the sides of each gun equal, in thickness, the diameter of its caliber. Then to develop the same force, per inch, from the powder of each gun, the inertia of the balls should be as the squares of the diameters of the calibers, respectively; that is, one should be 25 times as great as the other. But the balls, being one 2 and the other 10 inches in diameter, will weigh 1 pound and 125 pounds respectively—the weights being as the cubes of the calibers. Hence each inch of powder in the large gun will be opposed by five times as much inertia as is found in the small gun. This produces a state of things precisely similar to that of loading the small gun with 5 balls instead of 1; and although the strain thrown upon the gun by 5 balls is by no means five times as great as that by 1 ball, there can be, I think, no doubt that the strain produced by different weights of ball is in a ratio as high as that of the cube roots of the respective weights. This would give, in the example before us, an increase of from 1 to 1·71, or the stress upon the walls of the 10-inch gun would be 71 per cent greater than upon those of the 2-inch gun.

GREATER PRESSURE IN LARGE THAN IN SMALL GUNS.

The foregoing statement and comparison, however, do not present the whole case; for they are made upon the supposition that the charge of powder, in each instance, is as the square of the diameter of the shot, or that the cartridges of the 2 and the 10-inch guns are of the same length. This, if we take the charge of the small gun at $\frac{1}{3}$ of a pound, would give but $8\frac{1}{3}$ pounds for the large, or $\frac{1}{75}$ of the weight of the shot. The velocity obtained from this charge would produce neither range nor practical effect, and to obtain these results, that is, 1,600 feet a second, we must either increase the force through the whole length of the gun to 5 times that required for the small gun, or, the force remaining the same, we must provide for its acting through five times the space. Neither of these conditions can be practically accomplished. However, by an increase of both the charge and the length of the bore, the result may, in the limits under consideration, be attained. Thus, taking the large bore, if we double its length and make the cartridge five times as long, increasing the weight from $8\frac{1}{3}$ to $41\frac{2}{3}$ pounds—or perhaps, having an advantage from the comparative diminution of windage and the better preservation of the heat, with a charge of from 30 to 35 pounds—we may obtain the full velocity of 1,600 feet a second. But this again increases enormously the strain upon the gun.

It does not appear obvious, at a first view, how an increase in the charge should increase the tension of the fluid produced from it, if the cavity inclosing it be proportionably enlarged. If a steam pipe a foot long will sustain the pressure of a given quantity of steam, of a given temperature, a pipe two feet long, of the same thickness and diameter, will sustain the pressure produced by a double weight of steam from the same boiler. Why then should the pressure upon a cannon be increased by a double length of cartridge? The difference seems to be this; with the steam, the pressure is as in a closed cavity; with the powder, the tension depends upon the movement of the shot while the fluid is forming. Now, whether the charge be large or small, the motion of the shot commences while the pressure is the same in both cases, and before the charge is fully burned, and with the same velocity in both cases; but with the large charge the fluid is formed faster than with the small, while the enlargement of the cavity by the movement of the shot is nearly the same in both cases. This destroys the proportion between the sizes of the two cavities, and the tension must increase faster, and become greater, from the larger charge. The law of this increase cannot, from the complicate nature of the problem, be stated with any reliable exactness, but we may, I think, conclude, from the increased velocity of the shot, and many other effects, that the stress thrown upon the gun by different charges of powder, within ordinary limits, will not vary essentially from the square roots of those charges If then we increase, in the example under consideration, from a charge of $8\frac{1}{3}$ pounds to one of 32 pounds, the stress upon the gun, being as the square roots of these numbers, is raised from 2·88 to 5·65, or from 1 to 1·96. Having already increased the stress upon the gun, by the shot, from 1 to 1·71, if we multiply these together, we have a total increase of from 1 to 3·35. That is to say, if, under the conditions here stated, we load a gun of 2 inches caliber with 1 shot and $\frac{1}{3}$ of a pound of powder, and a gun of 10 inches caliber with 1 shot and 32 pounds of powder, the stress upon each square inch of the bores will be 3·35 times greater with the large than with the small gun; when at the same time, if the walls of both have a thickness proportional to the diameters of the calibers in each, the large gun will be incapable of sustaining a greater pressure per inch than the small one. Even with a charge of 12 pounds of powder, the stress upon the large gun must be more than double that upon the small gun when charged with one-third the weight of its ball.

It is calculated that about 8,000 dozen pounds of candles per week are used in the mines of Cornwall alone, taking no account whatever of the large consumption in private houses. This would make an annual consumption of about 600,000 lbs. of tallow every year; and the total value of candles used for mining purposes would, at an average of 5s. 3d. per dozen pounds, represent an expenditure of about £13,000 for candles alone.

A Mrs. Egbert, wife of one of the oil-well princes, recently forwarded $5,000 to provide a Christmas dinner for the soldiers in the Philadelphia hospitals.

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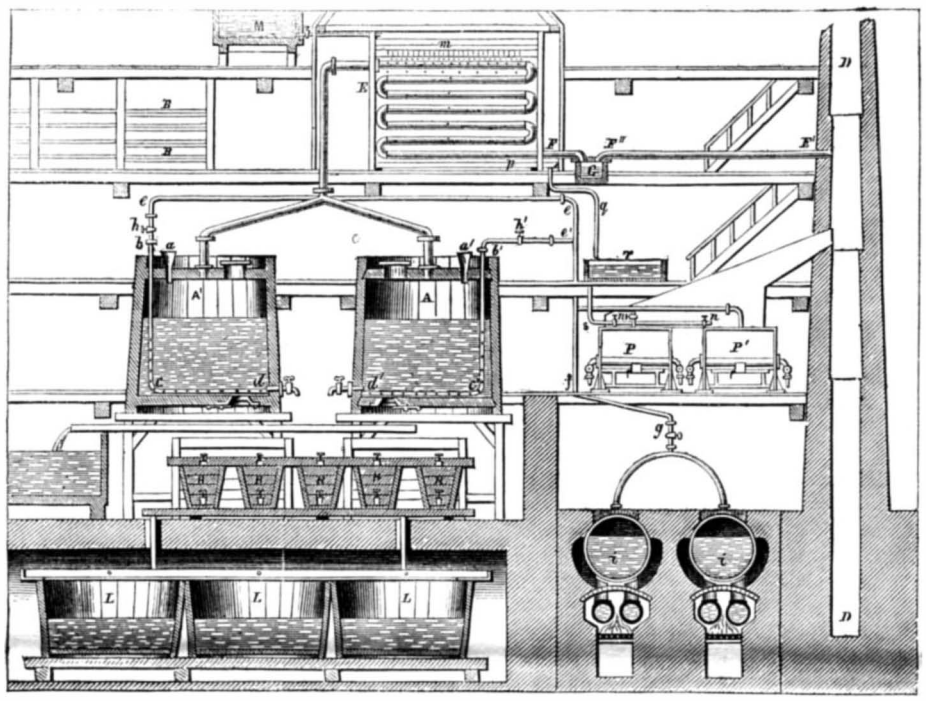
MAKING GRAPE SUGAR FROM STARCH.

We give herewith Payen's illustration of the apparatus, and description of the process, employed in France for the conversion of starch into grape sugar. The product is used for manufacturing beer and a coarse kind of alcohol, which is said to be extensively employed in the manufacture of French brandy :—

The saccharification of the starch is effected in large tubs or vats, A A′, constructed of stout wood, to contain 2,800 gallons. In one of these, A′, a lead pipe, *b c d*, coiled at the bottom, is placed, the circular portion being cut or perforated for the introduction of steam to heat the acidulous water with which it is two-thirds filled; the steam from the generator, *i*, is admitted to it at pleasure by means of the pipe, *b f e g*, and stop-cock, *h*. During the operation the vat is covered, and the disengaged vapor conducted to the chimney, D D; but before escaping it may de utilized in evaporating the sirup by conveying it through serpentine pipes, E F. By such arrangements the disagreeable odors resulting from the evaporation of the oil of the starch are considerably abated, being partly condensed in the serpentine pipe, so as to flow off with the water produced from the steam into a vessel interposed between the pipes, F G, and partly carried away by the pipe, F′ F″, or the uncondensed vapors may be conducted into the fire where any remaining traces of essential oil are consumed, and thereby the nuisance is almost entirely prevented.



When it is proposed to convert two tuns of fecula in such an apparatus, the substance in portions of two hundred weight in a trough or tub, with twenty-two gallons of water, and when thoroughly steeped it is introduced by a funnel, *a*, in quantities of four to five gallons at a time, into the large tub or vat, which should be previously charged with about thirty-two barrels of water, and three quarters of a hundred of sulphuric acid agitated with it, the whole being raised to 212° by forcing steam into it. This temperature is maintained till all the fecula is introduced, and it is found that the transformation is accomplished in thirty or forty minutes after the last portion of the starch has been added. The point at which the change is completed is easily ascertained by simply testing a few drops of the clear liquid with a drop of a solution of iodine, when, if the saccharification be effected, no coloration takes place; in the contrary case the characteristic violet of iodide of starch manifests itself. After the conversion into glucose, the introduction of the steam is suspended, and the next operation is the saturation of the free acid by means of carbonate of lime, and the consequent precipitation of sulphate of lime. The latter being but sparingly soluble, most of it falls to the bottom. It requires from ninety to a hundred pounds of chalk to saturate the whole of the free acid; and this must be introduced gradually to guard against the evolution of too much carbonic acid at once. If an excess of lime be used, it prevents the solution from clarifying so readily as when the sulphuric acid is barely taken up; this is shown by the cessation of effervescence, and the inability of the liquid to change the blue color of litmus to more than a feeble purple tint. When the saturation is completed, the mixture is either permitted to repose in the same vessel, or if it be required to operate upon another batch at once, it is drawn off into the lower vat, A″, where it is left at rest during twelve hours; the clear liquid is then racked through coarse bone-black in the filters, H H, the deposit of sulphate of lime being also thrown upon cloth filters, where it is drained and washed. The sirup as it flows off from the filter, having a density of 1·11 to 1·122, is retained in the reservoirs, L L L, from which it is raised by a pump or a chain of buckets to the reservoir, M; from this it is distributed in a horizontal channel, *m*, by numerous lateral apertures upon the serpentine evaporator, E F, and then flows by a channel, *p*, and tube, *q*, into a receiver, *r*, whence it can be drawn at will by the tube, *s*, and stop-cocks, *n n*, into the boilers, P P′, which are heated by steam, and in which the liquid is concentrated to 1·26 specific gravity. The sirup thus obtained, after reposing a sufficient time to allow the sulphate of lime precipitated by the evaporation to subside, is fit for the brewer or distiller; but if intended for the confectioner or liquor maker it should be allowed to rest for twenty-four hours, filtered when cold through coarse bone-black, and casked immediately. When it is desired to obtain the glucose in a solid state, the evaporation is carried so far as to concentrate the sirup to 1·38 or 1·39 specific gravity —73° to 74° Twaddell; it is then poured into the cooler, where it is kept till the crystallization commences, and thence transferred to the tuns in which the solidification is effected.

Of late years, instead of preparing the sugar in an amorphous solid mass, as by the preceding method, it is obtained in grains or regular crystals. The process for converting the starch into sugar is the same as that already described; but care is taken to do it more thoroughly, since any excess of dextrin in the sirup is found to prevent crystallization. After the acid has been neutralized, and the lime salt removed by deposition, etc., the saccharine liquid is decolorized, and concentrated to 1·300, or 60° Twaddell, in summer; and 1·262 or 53·5° Twaddell, in winter. At these stages it is racked off into large reservoirs where the lime salts settle down; and during this period it is necessary, in order to prevent any fermentation, that the liquid be cooled either by circulation of air or of cold water in a coil placed in the vessel. After thirty-six to forty hours, the sirup, being clarified and cooled to about 65°, is put to crystallize in ordinary tuns furnished with a false bottom placed over the lower one, which is pierced with a number of holes that are stopped with wooden pegs. These tuns are placed on stages along the walls of the room, twelve to fifteen inches above the floor. A sheet of lead or large canal or sluice, reaches along each range of crystallizing tuns. To avoid the fermentation of the sirup, which in summer often prevents the crystallization, six or seven ounces of sulphurous acid solution are added to the content of each tun. At the end of eight or ten days the crystallization commences and goes on, the crystals depositing in succession. When the bulk of two-thirds of the liquid becomes a mass of crystals, the pegs in the lower bottom are withdrawn, and the still fluid portion is permitted to drain off, the operation being quickened towards the end by tilting two adjoining tuns against one another. The drainings are conducted to the converting tun, where any dextrin the liquor may still contain is saccharified.

The desiccation of the drained sugar was long a work of difficulty, the moisture of the air being sometimes sufficient to convert it again to sirup, which, with the heat of the factory, melted and agglomerated the remaining portion. M. Fouschard has obviated these inconveniences by furnishing the tuns or tubs, R R, with tables of plaster of Paris, which absorb the portion of the interposed sirup. This very much quickens the desiccation of the crystals, especially in a current of air heated to 77°, taking care that the granules are not thereby soldered togetherr There is, however, a certain amount of the crystallized mass which has to be submitted to a second solution, namely, that which is agglommerated on the end of the loaf resting on the plaster; this must be separated, and the sugar extracted from the sulphate of lime, by grinding them between cast-iron cylinders, and dissolving in the ordinary way.

Coating one Metal with another.

The London *Times* states that the large iron floating fire engine kept moored in Chatham harbor, in readiness for use on the occurrence of fires either at the dockyard or in the town, has been towed down to one of the vacant slips near the boat-house at the dockyard, for the purpose of having the bottom cleaned and examined. On being hauled up on the slip the condition of the bottom of the vessel afforded another proof of the worthlessness of all the so-called "anti-fouling" compositions hitherto in use in the Royal Navy for preserving the iron plating, and at the same time preventing animal and vegetable accumulations on the bottoms of iron vessels. Perhaps in no other river or harbor in this country do the bottoms of iron ships foul so rapidly as in Chatham harbor, and consequently every precaution is taken by the officials for the preservation of the hulls of iron ships by means of the best anti-fouling mixtures which science has yet discovered. It appears that the new mercurial anti-fouling composition, the invention of Mr. Gisborne, is to be applied to the vessel.

What Industry and Energy can Accomplish.

Mr. J. C. Whitin, the mechanic in the firm of P. Whitin & Son, now the exclusive owner of the machine works in Whitinsville, Mass., is building a large shop, three hundred and fifty feet in length, by seventy wide, and four stories in hight, with foundery and forge shop to correspond, for mechanical purposes. With the old shop, parallel to, and connected with the new, three hundred feet by one hundred, and three stories high, it will make the largest establishment of the kind, owned by a single individual, in the United States. Mr. Whitin commenced life with but little, save skill, industry, and determination. He is the inventor and manufacturer of the famed Whitin Picker. The entire works when in full operation will employ over a thousand mechanics and laborers.

SPECIAL NOTICE.

JOSEPH W. FOWLE, of Boston, Mass., has petitioned for the extension of a patent granted to him on March 11, 1851, for an improvement in steam drilling machines.

It is ordered that the said petition be heard at the Patent Office, Washington, on Monday, Feb. 20, 1865.

All persons interested are required to appear and show cause why said petition should not be granted. Persons opposing the extension are required to file their testimony in writing at least twenty days before the final hearing.

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Correspondence

A Disconsolate Inventor.

MESSRS. EDITORS:—In the current volume of SCIENTIFIC AMERICAN, page 362, under head of "Machine for Registering Musical Notes," it says, "Herr Endres, of Mayence, discovered a machine which will write down music as fast as it is played," etc. "This machine which is still a secret (the working-principle) may be adapted with very little trouble and at small cost, to any new or old keyed instrument, such as the organ, piano, melodeon," etc., etc. This machine may be new to some, but it is not to me. I was not surprised at the announcement, but felt grieved at my own delay; for long ago (some five or six years), I conceived a plan for making such an instrument. Judging from descriptions of that of Herr Endres it would have been constructed on similar principles, I have since devised a plan, which is simple and effective, for registering music as fast as played. My reason for not making my device public was in order to acquire a thorough musical education or knowledge of keyed instruments, in order to the perfecting of my machine. So much for delay. I am now superseded. Let this be a warning to inventors in general. I do not wish to rob Herr Endres of the glory of his achievement, but make this statement to show that the idea was not original with him alone. This I can demonstrate to any musician or pianist.

If Herr Endres should doubt this statement, I can present a method for registering music, by playing the piano, which is simple and effective in operation. I can demonstrate the rudimental operation or working principle without resorting to his "secret" mechanism. As I stated before I have not my machine perfected or matured, and, as I am now superseded, I suppose I may as well defer further claim to this novelty. Yet I still lay claim to it as a Yankee idea. It is hard to beat Yankeedom; they will think, and you can't stop 'em. I could not pass unnoticed the above named article, as it gives all the praise to a foreigner. By publishing this communication you will do justice to an American.

FRANKLIN CARLISLE.

Milwaukie, Wis., Dec. 4, 1864.

[Our worthy correspondent is altogether too despondent about his invention. It does not follow by any means, that because Herr Endres of Mayence has invented a music registering machine, that every one else must sit down and fold their hands. Bring out your machine! put it through! Delays are certainly dangerous. Herr Endres is far enough away, but even if he were in the same town with our correspondent, one inventor would have an equal chance with the other; that is all any of us can expect. Perfect your machine, bring it to public notice, and if it have good qualities you will be certain of a reward.—EDS.

Universal Chuck for Jewelers Wanted.

MESSRS. EDITORS:—I wish you would mention in your interesting paper that watchmakers and jewelers need a small universal chuck for their lathes. It should be neat, strong and accurate, just large enough to take in the largest wheels and barrels of watches, and should also grasp small pivots. It would be one of the most useful tools in a shop. I have in vain searched for one in New York and Albany. I would give $25 for such an instrument.

L. F. HALL.

Fonda, N. Y., Dec. 10, 1864.

[Mechanics and inventors will no doubt bear this hint in mind. A chuck can be made and sold much lower than the price named, with a good profit.—EDS.

The Chicago Lake Tunnel.

A few days since the Common Council of Chicago made an inspection of the Lake Tunnel. The *Tribune* says:—

"The bottom was reached in safety, and the party stepped out into the void—a long bore, five feet in diameter, and stretching away lakeward a distance of eleven hundred and twenty feet—nearly one-quarter of a mile. A platform raised nine or ten inches from the bottom gave a good foothold, but left a rather humiliating amount of perpendicular room in which to walk. But the party set forward, bent (nearly double) on exploring the farthest recesses of the gloomy vault. 'Twas a long, wearisome creep, and long before the end was reached, the knees and back began to tire, while the elevated temperature—fifty eight degrees—made it uncomfortably warm.

"People who are accustomed to the idea of cool cellars in summer may be surprised at being told that the temperature at nearly eighty feet below the lake surface is so much greater than above ground, but such is the fact. There is a uniform temperature all the year round at a point about sixty feet below the surface, the average only varying with the latitude; in the latitude of Chicago it is about fifty-two degrees; the balance of six degrees being due to the evolution of carbonic acid gas from the lungs of the workmen and the burning lamps. Were not a good system of ventilation in use, changing the air often, the mercury in the thermometer would rise much higher from the operation of the above-mentioned cause.

"Down in that work the ventilation is as good as could be desired. A thorough draft is kept up through a large pipe extending the whole length of the work, and the operation of this is needed only to change the air made foul by breathing and boring. The soil through which the miners are digging is remarkably free from those poisonous gases which are so great an obstacle in most underground operations. Only twice have the workmen been troubled with gaseous outbreaks, and but one of those was of such magnitude as to necessitate a suspension of labor.

"At first this work was attended with many difficulties, the shifting sand offered an impediment at the beginning, which was only overcome by the employment of iron cylinders for the upper twenty seven feet of the shaft; and the pumps clogged, and the gearing broke, but now all goes on smoothly—save an occasional strike among the workmen—and the work proceeds nearly as fast as it would above ground. The miners dig out the clay, making a cylindrical hole of about six feet and a half in diameter, loading the clay on little cars, which are then run on a tramway to the shaft and thence elevated to the open air. They are followed at a distance of a few feet by the masons who lay the bricks in two courses, packing them into the clay round the lower half of the arch, and filling in with cement on the upper half. The whole is thus made compact, and capable of resisting any pressure short of one of those general upheavals which in times past have revolutionized the surface of our globe. The whole thing is solid as the rock itself, and there seems no reason to apprehend a collapse either outward or inward. If the work should be finished without accident, it would seem that there is no chance for future displacement.

"The work is now progressing at the rate of ten linear feet per day of twenty-four hours, the men being worked in three gangs, each of which takes an eight hours' shift; so that the job is prosecuted night and day. Nearly half a mile will have been finished by the first of May, at which time the now finished crib will be taken out to its destination—two miles from shore—and sunk; the work will then proceed from both ends, and the whole tunnel be finished and in running order by the end of 1866."

Asphaltum Mines and Springs in Santa Barbara County.

No section of California contains such immense outcrops of mineral pitch as the county of Santa Barbara. From the line of San Luis Obispo, where the Kuyamas river enters the sea, to the boundary of Los Angelos, opposite Anacupa, it is met in hundreds of places as hard as a rock, or soft as putty, as consistent as pitch, or as liquid as oil. Indeed, an immense deposit seems to underlie the lands of the country from Buena Vista lake to the ocean; and in boring for water it has been met with in such unpleasant quantities as to render valueless expensive outlays. A spring of it boils up in mid channel, opposite to the northern end of the island of Santa Cruz, which is of excellent quality, and is sometimes found so abundant as to be easily gathered from the surface of the sea by passing vessels. Several of the old California coasters assure us they have collected it repeatedly from ships' boats. It was in common use before 1846, in place of coal tar, for marine purposes, in painting iron and wood, for which it was found in every respect vastly superior.

Near the Carpentaria it is found close to the sea beach mixed with sand and clay, and of the consistence of putty or baker's dough. In another place on the sea cliffs of the Dos Pueblos farm, it is met in fine veins as brittle as rosin; while in the hills near the Mission of San Buenaventura the earth, for thousands of acres, is impregnated with the substance in a most extraordinary degree, and, as we are informed, in some places petroleum oil of an excellent quantity may be obtained by simply digging a well, which will fill up in a few hours. Valuable and extensive deposits both of asphaltum rock and of liquid pitch are also found in the vicinity of the Santa Ynez river. The formation extends into the upper valley of the Kuyamas, farther east, and even over into the opposite country near Buena Vista lake.

The most celebrated and best known deposit of asphaltum rock in the State is that on the Goleta farm, nine miles from Santa Barbara going up the coast. The substance obtained here has been used by the people of the country for the last fifty years for roofing and paving. It is the same article used for similar purposes in San Francisco since 1855. It is believed that some $30,000 worth of the mineral has been got out in that time by squatters and interlopers, to the detriment of the owner's interests. The formation is several hundred feet in breadth, and of unknown length and depth. It runs a great distance under the sea, and is exposed in immense masses in the high cliffs immediately overlooking the ocean. It is easily dug out and taken off in boats to vessels anchored a few hundred yards off. This is perhaps as accessible and valuable a vein of asphaltum rock as exists in any country. The hard material can be applied in a vast number of cases in the arts and sciences, and in building and construction.

Barnum's Museum.

A world of wonders is condensed in Barnum's American Museum. It is peopled by giants, pigmies, monkeys, Circassian and fat women; a living whale, seals, snakes; a great variety of fish in aquarial tanks; snakes and thousands of curiosities. A snug little office in a corner is the magic cave where the chief sorcerer and master of all these wonders exerts his powers. Barnum himself, busy, smiling, prompt, never at a loss, sits there pulling strings that move at once, hunters and seamen in Africa, the Asiatic Islands, the Arctic seas, and at the same time the tiny dwarf that trots in for a joke with Mr. Barnum, the singers and performers in the crowded lecture-room close by, and the millions of patrons who for thirty cents apiece receive the Open Sesame to uncounted sights of entertainment and instruction. The holidays are coming; and lo and behold, the tireless wizard is preparing for the people of the great city, and for their country cousins too, still other unknown wonders. Chief among them, a little bird whispers, is to be a Grand Spectacle which shall sparkle, glow and dazzle with splendors and astonishments far beyond aught that the Continent has ever seen. It is one of the miracles of a republic, that even this King of Showmen can render so much in return for so little; a miracle that only Barnum himself can explain. You can go and ask him all about it, if you like, at Christmas time.

HOW SOME FRENCHMEN EARN A LIVING.—Necessity—the mother of invention—has been fertile in expedients in the twelfth arrondissement of Paris. There is the maggot-breeder for the fishermen of the Seine; the money-lender who charges cent. per cent. by lending from sunrise to sunset; the poor *reveilleuse*, who goes from house to house, through the winter nights, to waken sleepers who must be at the markets; and there is the 'guardian angel,' whose business consists in seeing drunkards home from the wine shops, at the rate of ten sous per drunkard! Behind all these quaint bread-winners, there are crowds of men and women, who depend on public or private charity.

A VALUABLE New-Year's gift would be a year's subscription to the SCIENTIFIC AMERICAN. How many young mechanics would rejoice in being thus remembered by their employers! It would make them better workmen.

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RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

White Paint Composition.—The manufacture of white-lead for painting has been continued from the earliest ages to the present time, but without much improvement. It has always been objectionable for external use, where it is much exposed to the weather, owing to its oxidizing a short time after it has been applied. The oxygen of the atmosphere, acting on the lead, reduces it in a few months to a white powder, when it soon falls off.

When the oxide of zinc was first introduced for painting, a few years ago, it was supposed it would in most cases, supersede the use of white-lead as a pigment, as the same objection could not be used against it, that is, oxidation from the atmosphere. This was true, but a still greater objection was soon apparent, which was the extreme hardness with which it dried on the surface, and when acted on by the weather it soon peeled off in scales, leaving the material painted entirely bare.

In the list of claims published last week an invention was reported of a new paint composition for which Letters Patent have been obtained through the Scientific American Patent Agency, and which, as claimed by the patentee, obviates both of the above objections. The materials from which it is made, when properly prepared, form a homogeneous opaque pigment, so constituted and nicely proportioned that, when applied to wood, tin, iron, brick or stone, it will not oxidize or peel off, but will withstand the elements to a remarkable degree. It is well known by painters that yellow ochre is one of the most durable paints. Its constituents are silica, oxide of aluminum and oxide of iron—the latter giving it the yellow color. In manufacturing the improved paint composition, the oxide of zinc is substituted for the oxide of iron; these are then mixed with pure linseed oil and ground with powerful machinery until they become homogeneous.

The patentee claims for this composition the following qualities and advantages:—

First, that it mixes chemically and not mechanically with linseed oil, thereby forming a more perfect compound than oil and lead. Second, that it works more easily under the brush than either lead or zinc. Third, that when it is mixed for use and stands a few days, it will not become fat, as termed by painters. Fourth, that it can be put on either thick or thin, in one, two or three coats, as the case may require, without running. Fifth, that it mixes with all colors chemically, producing soft and beautiful tints. Sixth, that it will not harden and peel off under water, as zinc, but possesses great elasticity and durability. Seventh, that it will not injure the workmen who use it, as the materials are innocent—lead frequently producing that terrible disease, painters' cholic, and afterward paralysis or premature decrepitude and lingering death. Eighth, that 100 pounds contain more than three times as much linseed oil as the same quantity of good lead, which renders it, as all painters know, much more durable. Ninth, that 100 pounds will cover seventy-five per cent more surface than 100 lbs. of lead, and that the price is twenty-five per cent less per pound than lead, making it, for use, half the price of pure white lead. These are some of the advantages claimed for the paint composition. The inventor is James Trippe, Orange, N. J.

Car Door Latch.—This invention relates to an improved latch of that class in which the parts are arranged with the handles of the same in such a manner that when force is applied to the handles in order to disengage the latch in order to release the door, the same force, or its continuation in the same direction, will serve to slide open the door, thereby rendering but one manipulation necessary in order to effect the above result. John Stephenson, of New York City, is the inventor.

Mowing Machine.—This invention relates, first, to a novel and improved arrangement of a tubular axle and pendants, whereby the framing ordinarily used is dispensed with, and at the same time an extremely light and durable machine obtained. The invention consists, second, in a toothed segment and rack, arranged as hereinafter fully shown and described, for raising and lowering the cutter bar. The invention consists, third, in a novel manner of attaching a tube, on which the toothed segment is secured to the axle, whereby a firm connection is obtained and one which admits of the free turning of the tube. The invention consists, fourth, in a novel and improved manner of connecting the bent vibrating lever to the sickle bar, whereby the former is not allowed to interfere with any of the parts of the machine in whatever position the sickle bar may be in, and a shoe of moderate width permitted to be used at the inner end of the finger bar. The invention consists, fifth, in casting the shoe and tube, which form the main connection of the finger bar to the axle, all in one piece, whereby economy and strength in the construction of the machine are obtained. L. G. Kniffen, of Worcester, Mass., is the inventor.

Apparatus for fermenting Malt Liquors.—This invention consists in the employment or use, in combination with a fermenting tun, of a solid or hollow body, suspended from a rope or chain or otherwise arranged in such a manner, that it can be lowered more or less into the liquid contained in the fermenting tun, and that by its action the liquid is forced up in the annular space between the outside surface of the immersed body and the inside circumference of the tun, and the froth rising to the surface of the liquid during the fermenting process can be made to flow over the edge of the tun, and thus be separated from the liquid simply by adjusting the position of the immersed body. The froth thus discharged is received by a circular trough secured to the outside of the tun near its top edge in an inclined position and provided with a spout at its lowest point, through which the impurities discharged from the tun are conducted to a suitable receiver. In order to regulate the temperature of the liquid in the tun the immersed body is made hollow, so that it can be filled partially or wholly with cold water and ice, or either, and strips of wood or other suitable material secured to the inside surface of the tun, keep the immersed body properly in the center of the tun and guide it during its ascending or descending motion. Adolph Hammer, of 132 West 34th street, New York, is the inventor.

Burglar Alarm for Drawers or Tills.—The object of this invention is to obtain an alarm mechanism for a drawer or till, constructed and arranged in such a manner that an alarm will not only be sounded in case an attempt is made to open the drawer or till illegitimately, but a lock mechanism, which is combined with the alarm, will effectually prevent the opening of the drawer or till, so that the proprietor of a store will not depend upon the alarm solely to guard against pilferers, but will also have the lock, which is provided with tumblers, to aid in preventing such mode of thieving. The invention is a very ingenious one, and a great improvement over the till alarm now in use. F. H. Purington, of Willimantic, Conn., is the inventor.

Fuzes.

The construction of fuzes is now justly regarded as at once the most important and most difficult department of the science of gunnery. With the recent progress of artillery it has become more and more evident that the shell is a vastly more destructive projectile than solid shot; not merely against troops in the field and wooden ships, but for breaching purposes against the strongest fortifications, whether of stone, brick, or earthworks. Even iron-clad ships, which were long considered completely impenetrable to shell, are now found to be as vulnerable to cylindrical steel shell as wooden ships to the old spherical cast-iron ones. Now, since the action of shells is entirely dependent upon the precision and unfailing action of their fuzes, the right construction of the latter is of vital consequence to the efficiency of artillery, and at the same time it must be admitted that the problem has hitherto proved most intricate and difficult, and at the present moment far from satisfactorily worked out. The fuze originally was a very simple affair—a tube of beech-wood filled with a mixture of meal powder, saltpetre, and sulphur, in which a piece of touch cord was placed and left projecting at the top. This inserted in the shell and ignited by the flash of the charge in the act of firing, caused the projectile to explode in a certain given time, and proved sufficient for the necessities of the period, when shells, or as they were then called bombs, were merely employed in vertical firing—that is, projected upwards from mortars at an angle of 45°. The introduction of the practice of firing shell horizontally, and still more recent employment of rifled artillery firing lead-coated shot, demanded other requirements, to meet which fuzes have gradually assumed the aspect of a piece of mechanism. The old fuze was what was called a time fuze. Formerly when a town was bombarded the mortar battery probably remained at the same distance during the whole of the siege. Thus the time required to elapse between the firing of a shell and its bursting was a constant time, and the fuze once adjusted for the range no change in length was required, whilst they might be prepared at leisure. When, however, shell came to be used against moving bodies, as troops in the field or ships at sea, the power of making rapid changes in the length of fuze became necessary. A very simple alteration in the original fuze sufficed for enabling its time of burning to be instantaneously adjusted. Two channels instead of one were made in the old beech-wood fuze side by side, one filled with ordinary powder communicating with the bursting charge, the other with the slow-burning fuze composition. The outside was graduated to a scale, and by piercing the tubes at any given point so as to establish a communication, as soon as the composition burnt down to the point of contact the shell exploded. The efficiency of shell in certain cases was still further increased by the introduction of the percussion fuze, which, exploding on striking the object aimed at, obviated, in those cases in which it was applicable, all difficulty with regard to adjusting the fuze according to the range.—*Mining Journal.*

Valuable Minerals in California.

We often hear outside of California of the high value and extended use of metals and minerals which abound in immense deposits in the Pacific domain. Bismuth, which is extensively used in type-making and the mechanical arts, and is now very high and scarce, is said to be found plentifully in some of our mineral formations. Antimony exists in immense masses, and of very rich quality, near the Tejon, and can be carted away from the top of the ground; it is said to contain a handsome ley of silver. Zinc and tin, which are now very expensive metals, are met with in valuable lodes in the counties of Mono and Los Angelos. Chromic iron is found in immense abundance in Monterey and other Southern districts. Iridium, osmium and platinum are not scarce in the gold washings of Klamath and Del Norte counties, and discoveries of these have also lately been made in Idaho. The sulphur deposits of Clear Lake and those of Nevada Territory are on a magnificent scale and of the purest quality. Borax, nearly free from extraneous matter, can be gathered by bushels, and there is no end of it, seemingly, in all the mountains of Lake county, where obsidian or volcanic glass, ready to make wine-bottles at a blow, is as plentiful as the world wants—a true mine of glass. Of porcelain clay of the finest quality there is a like quantity; and of umber, terra sienna, paint ochres of different colors, manganese and magnesian earths there is great plenty. As California has some of the purest aluminous clays in abundance, the new metal aluminum could likely be profitably made. As to copperas, soda, alum, jasper, agate, chalcedony, hematite and such substances, there is no end of them. It would be interesting and important to the owners of lands in which the various minerals above mentioned exist, to learn the markets and places of demand for them in Europe and the Atlantic States, and the prices which they ordinarily command there. Perhaps some correspondent who is familiar with the subject may have a few words to say about it.—*San Francisco Bulletin.*

A correspondent of the *Bristol Daily Post* states that a working man has, after 20 years' labor, at length solved the problem of perpetual motion! The secret may be had for the trifling sum of $500,000.

[We intend purchasing this mechanical marvel forthwith.—Eds.

A colossal bronze bust of William C. Bryant is to be placed in the Central Park in this city.

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Improved Percussion Shot and Shell.

The projectiles shown in this engraving are peculiar in construction and of the class known as composite shells, or those made up in several pieces. In Fig. 1 a section of an elongated projectile is shown. In this form A is the outer jacket and B the inner. In both of them a series of grooves are turned which are afterward filled with lead, C, poured in through a hole bored in the outer jacket. At the rear of the inner jacket a space is left between it and the external casing ; there is also a cavity in the shell proper, which is to be loaded with powder as usual. On the outside of the shell a band, E, of soft metal is cast to carry the forward end of the shot and center it accurately in the bore of the cannon. These shells explode by percussion or on striking ; and the inventor states that when the forward end strikes the object aimed at, the lead bands, C, will be cut off by the shock, when the caps will be exploded by the back part of the shell striking against them. The inventor also states that by the peculiar shape of the elongated missile all tumbling is prevented, and that it will continue end-on throughout its flight.

The round shell shown in Fig. 2, is essentially the same in principle but an aperture is left for the insertion of a time fuse, which allows the moment of explosion to be regulated at will. The resistance of the lead bands, C, can be increased at will by adding harder alloys so as to delay the moment of explosion in the elongated shell until it penetrates some distance in the target fired at.

A patent was procured on these shells by Anthony Pfund, on the 22d of October, 1861; for further information address the inventor at 114 West Thirty-fifth street, New York.

Fig. 1

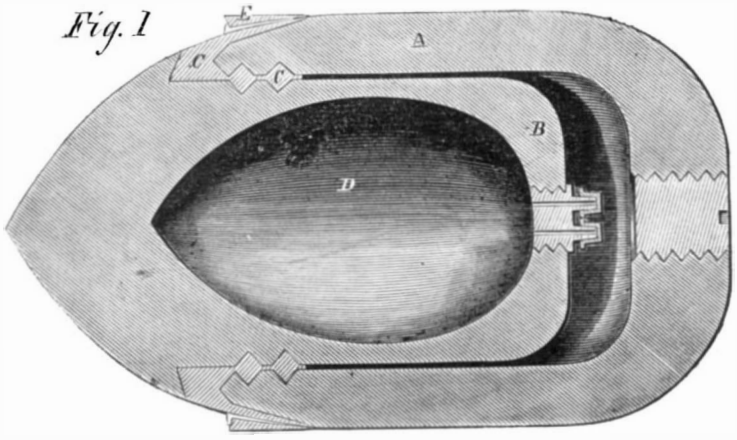
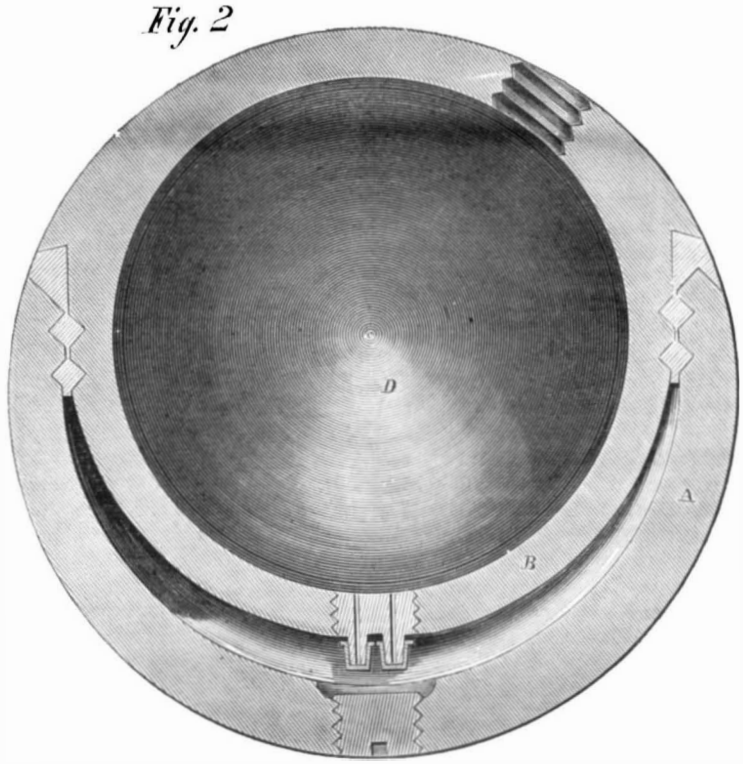


Fig. 2



PFUND'S SHOT AND SHELL.

Dispensing with the Steeping of Flax.

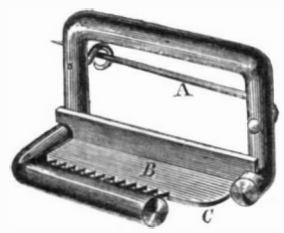
It appears from the *Society of Arts Journal* that a French manufacturer named Bertin has invented what is reported to be a successful method of dispensing with the steeping of flax. After the fibers have been crushed in the ordinary way, M. Bertin submits them to a new process, that of friction between two channelled tables, which have a sideway as well as to-and-fro motion; in fact, the action is similar to that of rubbing the fibers between the palms of the hands, but under considerable pressure, and with great rapidity. The fiber is afterward beaten in water, which carries off every particle of woody matter, and leaves the flax completely unbroken and in parallel masses. The principle of friction tables has been applied by M. Bertin in other cases, and is said to furnish an economical, rapid, and perfect mechanical action.

Chloroform Poisoning.

Dr. Macker related the following case to the Medical Society of the Haut-Rhin : "A soldier, aged 27, on furlough, and in a state of drunkenness for several days past, seeing a bottle on a table, which he thought contained alcohol, drank off its contents, which consisted, in fact, of 12½ drachms of chloroform. He was found soon after vomiting, and soon became insensible, still continuing to discharge mucosities. The pupils were enormously dilated, and his aspect was cadaveric; the respiration was stertorous, the pulse one hundred, and feeble, and the action of the heart occasionally tumultuous. There were present utter loss of consciousness, complete relaxation of the limbs, and absolute general anæsthesia. After a short period the pulse became insensible, the respiration was arrested every now and then, and there was tracheal *rale*. Stimuli to the surface and artificial respiration were resorted to, and strong coffee infusion was injected. This alarming condition continued three hours, the anæsthesia remaining complete and the pupils dilated, while occasional contraction of the limbs was observed. An hour later, however, the pulse rallied, and the skin became warmer, but anæsthesia still persisted. At the end of the sixth hour the amelioration was very manifest, and in another hour he was carried to the hospital. He retained no memory of what had passed, and neither convulsions nor delirium ensued; and the next day he complained of little but what might be due to his excess in drinking."

SCOFIELD'S SEWING WORK HOLDER.

This little article is intended for holding work so that the operator can draw or stretch it with the left



hand while using the needle with the other. It is fastened to the dress near the knee by the pin, A, and there is a serrated plate, B, which acts like the tongue of a buckle and holds the work firmly; the harder the seam is stretched the tighter the plate bites upon the work. The cloth is introduced at C, and the aperture is of such a width that seams of any ordinary size may be inserted. This is a very useful and durable little appendage, and will doubtless be appreciated by our lady readers. It is made of brass silver-plated, or in German silver, or any other metal as desired, and will no doubt be popular. It was patented on Feb. 19, 1861, by H. G. Scofield, of North Stamford, Conn.; address him for particulars as to rights, etc., at that place.

Remarkable China Ware.

An oil millionaire, out of gratitude to the source whence his wealth was derived, and with a desire to keep it before his mind, has had a complete set of table equipage made in Philadelphia, of china and glass. The embellishments of the plates, dishes and tureens are *fac similes* of the apparatus used in producing petroleum. The dishes bear on the center beautiful vignette views, representing wells in process of boring, with the derricks over the orifice. The tureens are similarly adorned, while each separate piece is blazoned with vignettes descriptive and illustrative of the process of harvesting petroleum. The entire set is of the most costly character. The china is the finest and best imported, and the decorations are in the highest style of the decorator's art. The Messrs. Kerr were instructed to spare no pains in executing them, and they acted accordingly. The decanters, wine goblets and tumblers are alike engraved with the insignia of petroleum. The completed ware is a curiosity. Nothing like it was ever seen in those parts.

A New Army Corps.

Major General Hancock, a veteran officer of high military ability, is now recruiting in Washington city the "First Army Corps," designed to embrace 20,000 men. Any veteran, who has served two years, has been honorably discharged, and is physically qualified, may enlist in the corps for one, two or three years. Those enlisting will receive from the Government a bounty of $300 as soon as they are mustered in, and, in addition, the regular instalments from the Government, in proportion to the period of enlistment, as follows :—$100 for one year's service, one-third paid on enlistment; $200 for two years' service, one-third on enlistment; $300 for three years' service, one-third on enlistment. Applicants should address, in writing, "Adjutant General of the Army, Washington, D. C."

A Four-legged Hen.

At the last meeting of the Polytechnic Association, Dr. Rowell placed upon the President's table a large living hen with four legs. The hinder pair were fully formed, but are not used in walking; being curled up and carried. Dr. Rowell remarked that they seemed to be part of a second animal in a rudimentary condition attached to the rump of the hen. He supposed that the fowl was hatched from a double yolked egg, which the dam had failed to push out of the nest—an unusual oversight.

Mr. William W. Murphy, Consul General at Frankfort-on-the-Main, sent to the New York Sanitary Fair a gold coin, believed to be the smallest in the world. Its value is one-sixteenth of a ducat, its weight two grains, and it is about an eighth of an inch in diameter. It is still in perfect preservation, although it was issued by the city of Nuremberg about the year 1814, when it was a free city of the Germanic empire. It is now in possession of a member of the Numismatic Society of New York.

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NEW YORK, SATURDAY, DECEMBER 24, 1864.

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WHAT CAN BE DONE FOR INVENTORS.—ADVICE GRATIS AND ADVICE FOR PAY.

For the information of Inventors, we would state that it is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability, without charge. Persons having made what they consider improvements in any branch of machinery, and contemplate securing the same by Letters Patent, are advised to send a sketch or model of it to this office. An examination will be made and an answer returned by early mail. Through our Branch Office, located directly opposite the Patent Office in Washington, we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor most reliable advice as to the probabilities of his obtaining a patent, and also as to the extent of the claim that it is expedient to set up when the papers for an application are prepared. For this special examination at the Patent Office we make a charge of Five Dollars. It is necessary that a model or drawing and a description of the invention should accompany the remittance.

The publishers of this paper have been engaged in procuring patents for the past eighteen years, during which time they have acted as Attorneys for more than TWENTY THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

Pamphlets of instructions as to the best mode of obtaining patents in this and all foreign countries are furnished free on application.

For further particulars as to what can be done for Inventors at this office, see advertisement on another page, or address

MUNN & CO.,
No. 37 Park Row, New York.

STEAM ENGINES IN COLD WEATHER.

It is a curious fact that steam engines, in general, are put up in situations where no other machines would be: in cold bleak exposure where the winds sweep directly on them; in rough sheds where the rain drops down on the cylinder, and dust flies into the journals, and in all conceivable spots where loss can ensue by their imperfect operation, or damage come from the elements. Where no animal used by man could exist, there shall the steam engine be found. Of course, such a state of things is the result of the grossest ignorance and laxity of management, but these should never have been tolerated, and changes ought to be made where they exist.

From this writing, henceforward, until the return of more genial weather there will be frequent casualties from the circumstances mentioned. Feed pumps and pipes will freeze up and burst, and vertical tubular boilers will meet a like fate. Left over night in cold sheds, the water in them will soon freeze, and the consequent expansion will work the usual destruction. Many instances have occurred of boiler explosions caused by feed pipes freezing solid. No water passes to the boiler, and what remains is soon evaporated. The flues or crown sheet burns, and are forced down, even if no greater injury occurs. When the tubes are not frozen up, much damage ensues from the great extremes of heat and cold the boiler has to sustain; leaks frequently start from this cause. Where steam engines are exposed, the water should be drawn out of the feed pipe, and pump every night. There should be a pet-cock between the two valves, suction and feed, by which to empty the pump barrel and valve chambers, and another cock in the lowest part of the suction pipe; bends sometimes occur which hold water, while the body of the pipe is clear. The pump ought to be boxed up; also the exhaust pipe if it enter or leave a heater. The heater must also be emptied, so that no injury may happen to it. With these simple precautions no damage can occur, and the loss which arises not only from the expense of repairs but also from the stoppage of the factory will be avoided.

WILL PHOSPHORUS SET WOOD ON FIRE?

Professor Doremus having stated in one of his lectures that phosphorus burns with a flame, the heat of which is not sufficiently intense to set wood on fire, some of the daily papers which are advocating the cause of Jeff. Davis, have seized upon the statement, as proving that the recent attempt to burn this city was not directed by men of intelligence, and therefore could not have originated with the arch rebel.

Phosphorus has a strong affinity for oxygen, and is constantly absorbing it from the atmosphere when exposed to its action. The absorption is usually sufficiently rapid to cause a feeble glow, visible in the night, but not in daylight; and persons have been frightened into convulsions by having "Death," or some other startling word, written with phosphorus on the walls of their bedroom—the writing being invisible until the gas was turned off, when it came forth in letters of fire.

If the phosphorus is spread out into an exceedingly thin sheet, so as to expose a large surface to the action of the air, the absorption of the oxygen will be so rapid as to kindle the substance into flame. This extended surface is most readily obtained by dissolving phosphorus in some volatile liquid, and pouring the solution over some surface on which it may spread; then as the liquid evaporates, it will leave the phosphorus very thinly extended. The best liquid for this purpose is bisulphide of carbon, which is a powerful solvent of phosphorus, and exceedingly volatile.

Our readers will remember that a few years since, a good deal was said in the English newspapers about an incendiary shell, filled with a solution of phosphorus in bisulphide of carbon. It was gravely stated that this shell was too destructive for the humanity of the English people!—a humanity that was gratified by blowing the Sepoy rebels from the mouths of cannon, by the destruction of peaceful hamlets along the shores of the gulf of Finland, and by the bombardment of Kagosima.

The truth was that the shells were wholly inefficient, from the property of the phosphorus flame pointed out by Professor Doremus. Whenever the shells burst the liquid itself would take fire and burn up, but it failed to set other substances on fire.

The villains who tried to burn this city provided themselves with phosphorus dissolved in bisulphide of carbon, and if they failed to use sulphur, which the phosphorus will set on fire, and which in its turn will convey the flame to wood, they did not fail to employ an effective substitute for sulphur, as the event showed; for the furniture was set on fire.

The real cause of the failure of this fiendish attempt is that which we have already pointed out. The criminals had not sufficient knowledge to add to their incendiary piles a quantity of some substance containing oxygen which would have been set free by the heat, and would have continued the fire with the greatest violence and intensity.

THE ONE THING TO DO WITH THE CURRENCY.

The high price of gold is no sign of impaired confidence in the credit of the Government; nor is it a necessary result of the war; it is simply an inevitable effect of certain laws of Congress, namely: those laws authorising the issue of four hundred millions of treasury notes for circulation. Had these laws been passed in a period of profound peace, gold would have risen to the same price that it now commands. That the issue of an excessive quantity of paper money will lower its value, as compared with that of the precious metals and other commodities, has been proved by most disastrous experiments in Russia, Austria, and other countries—experiments that were made in times of peace.

In November, 1861, Salmon P. Chase, Secretary of the Treasury, estimated the bank note circulation of the loyal States at $130,000,000, and the specie, including the deposits in the banks, at $210,000,000, making a total of $340,000,000. This was the portion of the currency of the world which fell to the share of these loyal States under its natural distribution by the inexorable laws of trade. As we have repeatedly shown, it is impossible to change the aggregate value of this currency, unless there should be a change in the wealth and commerce of the country as compared with the wealth and commerce of the rest of the world. Consequently, any change in the volume of the paper portion of the currency must be necessarily accompanied by a corresponding change in its price. Our readers will remember that before the change in the price of a single article, we predicted in the plainest language the general advance in prices that has resulted from the inflation of our currency.

Assuming the estimate of the Secretary to be correct, the $200,000,000 of specie might have been displaced by government notes without any considerable advance in the price of gold and other commodities. This, in fact, was the case; there was no great advance in prices when the first $200,000,000 of "legal tenders" were issued. The principal effect of this issue was to drive the gold out of circulation, and out of the country. It converted our mixed currency of gold and paper into one wholly of paper of about the same value—a change of no great importance. But all further issues inflated the currency, and thus lowered its price, or in other words, raised the price of gold.

As the issue of the $200,000,000 of currency in excess of our share of the currency of the world, is the measure that has wrought all the evil, the simple remedy is to withdraw this amount of notes from circulation. The only way of doing this is by funding them. If bonds were offered for this purpose, all that great majority of the people who are interested in lowering the price of gold would be prompted to subscribe for them. If every man who has any money in his pocket would invest half of it in these bonds, the remaining half would become worth just as much as the whole is worth now, and he would have his investment into the bargain. There can be no doubt that there is sufficient public interest felt to secure the success of the measure, and this measure adopted would bring gold to par or very near it. Our whole internal revenue of $300,000,000 would then be in gold or its equivalent. The credit of the Goverment would be established in Germany and other parts of Europe beyond all question, securing an unlimited sale of our bonds at nearly par in specie. This would insure our ability to carry on the war for

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whatever length of time might be necessary to wear out the rebel armies. The restoration of our currency would diminish by one half the cost of prosecuting the war, and would check the growth of the public debt by an amount equal to $1,000,000 per day. It would double the incomes of that large portion of the people who live upon wages. Finally, it would place our finances in the sound condition, and secure their conduct in the provident spirit, which alone is worthy of a rich and powerful nation.

To make this measure fully operative, an act must also be passed repealing all provisions for making any interest-bearing notes a legal tender for debts. A considerable portion of the $210,000,000 of specie estimated by Secretary Chase as being in the country in 1861, was held by the banks. That portion has been displaced by interest-bearing "legal tenders." But in order that there may be no inflation of the currency with $200,000,000 of government notes in circulation, the banks must be compelled to absorb their share of these notes.

TINDER.

When a piece of paper is set on fire, it all burns up except the tinder—which comes from the hot blaze unburned. And yet, if a spark fall upon this tinder it will catch fire and burn far more readily and surely than paper will. Why does it not burn in the blaze with the other portions of the paper?

Paper is made mostly of vegetable fiber, which is composed principally of carbon, oxygen and hydrogen. The three elements when combined in this substance are all solid, but if they are separated, the oxygen and hydrogen take the gaseous form, while carbon continues solid. By the application of heat the vegetable fiber is decomposed, when the oxygen and hydrogen expand into gases. As the hydrogen at the high temperature comes in contact with the oxygen of the air, it combines with it to form water; in other words, it burns in the form of a blaze.

Could the carbon come in contact with the oxygen of the air at the high temperature of red heat, it also would be burned, but the volume of hydrogen envelopes it, thus preserving it from contact with the air. The body of hydrogen itself burns only upon its outer surface.

The heat absorbed by the hydrogen in its change from the solid to the gaseous state cools down the carbon below the temperature at which it will combine with oxygen, so that as the last of the hydrogen passes away, the fire is extinguished, leaving the carbon in the form of tinder. If paper is kindled in sufficient mass to keep up the temperature of the carbon to the combustion point, it also will combine with the oxygen of the air to form carbonic acid, which will pass off as a gas, leaving only the incombustible ash, which is the small quantity of mineral matter contained in the paper.

PROF. DOREMUS'S LECTURES.

FIRST LECTURE.

According to appointment Prof. Doremus gave the first lecture of a course on Pneumatic Chemistry at the Cooper Institute, on the 10th inst. Owing, doubtless, to the inclemency of the night, the hall was not filled to its capacity, but the audience made up intellectually what it lacked in numbers. The large hall was about two-thirds filled.

Professor Doremus introduced his subject by a general allusion to the importance of science on the world at large, and the variety of themes it offered for investigation and discussion. Through science we learned the structure of the globe, we made great advances in agriculture and the arts, and attained a more perfect state of civilization. Of the several themes, however, none were more attractive than Gases, "the ghosts or spirit form of matter." The peculiar features or properties of these were undiscovered until the last century; they are now known to possess qualities in common with ponderable bodies. The learned lecturer in speaking of the intricacy of chemical science alluded to astronomy, and asked, if this latter were bewildering in its manifold changes and infinite distances, what shall be said of chemistry whose transpositions, complications, combinations and separations are almost inconceivable? Many experiments were made to prove the assertion that gases had properties in common with solids. Thus a number of lighted candles were placed in the bottom of a deep glass jar and suddenly extinguished by pouring gas over them from another jar above, showing that its contents descended upon the flame. The weight of common air was shown by a globe attached to a weighted scale so that the beam was just poised. When the air was pumped out of the globe by an air-pump on the stage the weighted end of the scale preponderated.

SECOND LECTURE.

Among the most striking experiments exhibited at the second lecture was the decomposition of water by sodium. A tall inverted bell glass filled with water was standing in a pneumatic trough on the platform, and the lecturer took some small pieces of sodium from a phial in which the metal was covered with naptha to shield it from contact with the air, and wrapping them in bits of paper to prevent his fingers from being burned, he pushed them under the bell glass. The sodium being lighter than water rose to the surface in the glass, and as oxygen has a stronger affinity for sodium than it has for hydrogen, the water was decomposed; the oxygen of the water combining with the metal sodium to form caustic soda, and the hydrogen being set free as a gas.

Water was also decomposed by potassium. In this case the metal was thrown upon the surface of the water where it swam about in the most lively manner, decomposing the water, combining with its oxygen to form caustic potash, and setting the hydrogen free. The hydrogen as it was set free took fire, combining with the oxygen of the air, again to form water. The experiment being on a very large scale, the action was attended by violent explosions and very brilliant corruscations.

The extreme lightness of hydrogen was shown by holding an inverted jar filled with the gas under a burning gas jet, and suddenly turning the jar over so as to bring the open mouth upward. The gas from the jar immediately floated upward in the air, and as it came in contact with the jet it burned with a loud report.

The novelty of Professor Doremus's experiments consists in the unparalleled scale on which they are conducted. In decomposing water with potassium, he had a tank 5 by 10 feet in size, and blocks of ice weighing 100 pounds.

A NOTICEABLE FACT.

While every other journal in the country has doubled its subscription price, the rates of the Scientific American are the same as last year, so far as relates to our regular mail subscribers. Every intelligent reader can see at a glance that it is only by a large subscription list that we can publish the paper at present rates without incurring a loss. We feel certain that this hint will be enough. The Scientific American is a sufficient recommendation of itself without further comment, and in continuing to furnish it at the usual rates, we count largely on the support of our patrons.

A Large Magnet.

Among the philosophical apparatus belonging to the Free Academy in this city, is an electro magnet weighing 650 pounds, which has held seven men suspended at one time, and how much more weight it would support nobody knows. This magnet was made by Charles T. & J. N. Chester, of 104 Centre street, in this city. It is formed of two round bars of the softest iron, each 4 inches in diameter and 24 inches in length, which are secured at one end by massive screws to a cross piece to form a U magnet. The bars are wound with 200 pounds of No. 13 copper wire, insulated with cotton and shellac, and laid on in eight equal lengths, making the finished bar about eight inches in diameter. The armature is a bar of soft iron weighing 80 lbs. A neat wagon is employed for moving this magnet about the room, or it may be suspended from the ceiling by means of a block and tackle.

Kimball's Screw-holder.—From a misapprehension of the uses of this efficient little article, recently illustrated on page 384 of this volume, it was stated to be a *workholder*. The inventor informs us that he intended it solely as a screw holder, for which purpose it is well adapted. The patent was issued Nov. 8th, 1864, not Aug. 30th, as given.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING DECEMBER 13, 1864.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.

45,382.—Potato Masher.—Wm. Ball, of Peru, Mass.:

I claim, first, The standard, b, terminating at its upper end in a horizontal arm, m, for supporting the follower by means of its rack and pinion, and swiveled at its lower end in the ring supporter, f, so as to be capable of being turned horizontally to one side, in combination with the said ring supporter, f, and standard, a, as herein described.

Second, The cylinder or shell, e, provided at its lower edge with lugs, c, in combination with the slots, n, and supporting ring, f, in the manner and for the purpose specified.

45,383.—Harvesters.—Joseph Barnes, of Rockford, Ill.:

I claim, first, The combination of the frame, the driving wheel, the gearing and the tongue, substantially in the manner described.

Second, The bed-plate or gear frame, A, when constructed and arranged to operate as described.

Third, The combination of the driving wheel and gearing with the bed-plate, when arranged for joint operation, as set forth.

Fourth, The combination of the stationary toothed ring, D, with the planetary gear, as described, for the purpose of driving the crank shaft through the tubular axle of the driving wheel, as set forth.

Fifth, The combination of the foot-lever, C, the toothed ring, D, and the flange, b', substantially in the manner described, for the purpose of throwing the mechanism into and out of gear, as set forth.

Sixth, The tongue, constructed substantially as described, for the purpose of allowing it to be changed from a tongue for a harvester to a sweep for a horse-power, or vice versa, as specified.

45,384.—Lamp Wicks.—Thomas Bingham, of Newburgh, N. Y. Ante-dated Jan. 31, 1863:

I claim the substitution of wool, in whole or in part, for wicks to lamps for burning fluids, camphene, kerosene, carbon and other oils, and for all illuminating purposes requiring a wick or conductor, substantially as set forth and described in the foregoing.

45,385.—Hay and Straw Cutters.—C. D. & W. S. Brewer, of Lewisburg, Pa.:

First, We claim the press-board, B, shaft, k, arm, R, connecting rod, Y, and treadle, L, when arranged and operating as and for the purpose specified.

Second, We claim the rake, F, when attached to the press-board, B, operating as and for the purpose set forth.

45,386.—Stitching Horse.—George F. Brockway, of Washington, D. C.:

I claim a stitching horse provided with folding legs, a reach and clamps, all arranged substantially as herein shown and described.

I further claim the toggle, spring strap and treadle, and applied substantially as herein set forth.

[This invention relates to a new and useful improvement in stitching horses, such as are used by saddlers and other workmen in leather for the purpose of holding and clamping the same while being stitched.]

45,387.—Machine for Husking Corn.—A. W. Case, of South Manchester, Conn.:

I claim the revolving hopper, B, composed of a series of boxes, a, at the periphery of a wheel, in combination with the concave of fluted rollers, C, all arranged to operate in the manner substantially as and for the purpose herein set forth.

I also claim the cutter wheel, f, when used in connection with the revolving hopper, B, and concave of fluted rollers, C, for the purpose specified.

I further claim having the boxes, a, of the hopper, B, placed in an oblique position, so that the ears of corn will be prevented from lodging or catching between the rollers, as herein described.

[This invention relates to a new and improved machine for stripping husks from the ears of corn after the latter have been detached from the stalks.]

45,388.—Coal Scuttle.—George Chambers, of Ithaca N. Y.:

I claim the aperture, g, the slide, c, with its handle, and the false inclined bottom, b, when used in connection as described, and equivalents thereunto, for the purposes set forth.

45,389.—Heating Apparatus.—Thomas S. Clogston, of Boston, Mass.:

I claim so constructing and arranging a heating apparatus, in the manner described.

45,390.—Gas-Regulating Valves.—Charles M. Cresson, of Philadelphia, Pa. Ante-dated Dec. 3, 1864:

I claim a valve having a stem or tail, in which are two or more excavations or depressions of different lengths, arranged substantially as and for the purpose described.

45,391.—Inkstand.—David Cumming, Jr., of New York City:

I claim the case, A, with a movable bottom, B, substantially as described and for the purpose set forth.

45,392.—Hoop Skirts.—Theodore D. Day, of New York City:

I claim forming the joints in the front portion of skeleton skirts, in the manner specified, in order that the skirt may be folded or compressed when the person is seated, as set forth.

45,393.—Wardrobe Bedstead.—A. Dietz, of New Orleans, La.:

I claim, first, The hinged bottom, C, and platform, F, with bars, m o, to sustain the musketo net, in combination with the wardrobe, A, constructed as herein shown and described.

Second, The slide, i, links, j, and spring bolts, k, in combination with the catches, g, platform, F, and wardrobe, A, constructed and operating in the manner and for the purpose substantially as set forth.

[This invention consists in a hinged bottom, with legs, and hinged adjustable musketo frame, in combination with a wardrobe, in such a manner that on opening the wardrobe the bed bottom can be readily folded down and the musketo frame up, and locked, and by these means a bed can be fitted up and protected by musketo netting in a few minutes and with little labor. The musketo frame, when raised is fastened by double spring catches, which can be released by an easy and simple motion of the hand.]

45,394.—Machines for Loading Hay.—Leopold De Lacee, of Newark, N. Y.:

I claim, first, The supplemental endless carrier, M, when arranged

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n the manner substantially as shown and described, so as to be capable of adjusting itself either wholly or partially by its own gravity, to operate in connection with the main carrier, as and for the purpose set forth.

Second, The endless rakes, A*, in combination with the pulleys, X, bearings, q, and bars, A', all arranged substantially as shown, for the purpose of raking up the hay or grain, and depositing it upon the carrier, E, as described.

Third, The arrangement of the frames, A F, and carrier driving gea , I J, substantially as herein shown and described, for the purpose of rendering the carriers operative and inoperative when desired.

Fourth, The combination of the endless carrier, E M, endless rakes, A, mounted on wheels, and all constructed and arranged to operate when attached to a cart or wagon, substantially as and for the purpose herein set forth.

[This invention relates to a new and improved machine for raking up hay or grain from the field after being dried or cured, when cut and left by the harvester, and depositing the same on the cart or wagon.]

45,395.—Corn Planter.—John Doak, of Keithsburg, Ill.:

First, I claim the adjustably-pivoted frame, E, when provided with the shovels, F, conducting tubes, F', grain boxes or hoppers, H, and covering wheels, I, and adapted to be operated by the lever, J, in the manner and for the purpose set forth.

Second, I claim operating the dropping valves, K, by means of pivoted arms or bars, F2, actuated respectively by an angular groove, l, in the seed slide, L, substantially as set forth.

45,396.—Affixing Knives to Straw Cutters.—Jacob Doerksen, Derry Church, Pa.:

I claim the construction of the knife, A, with its handle, a, and fulcrum shaft or pin, E, screw and nut F, with the attached elliptsoidal cutting blade constituting Fig. 3, in combination with the compound or double boxes, B' B'' with its slot, c, and screw bolts between them, resting on the baseplate, b, attached by its brace, D, to the machine as shown, substantially in the manner and for the purpose specified.

45,397.—Gumming and Feeding Envelope Blanks.—James B. Duff, Patchogue, N. Y.:

I claim first, The manner of constructing and fixing by a latch and catch the movable bed, A, so that it can be turned under the gumming box and fixed in its place and turned back out of the action of the gum box, without the necessity of stopping the machine.

Second, I claim the arrangement of the parts consisting of the plate, e, the rod, f, and the spring, and combining them as described, so as to make the plate, e, adjustable, and at the same time to keep and carry pressure upon the edges of the blanks.

Third, I claim the application of the india-rubber cloth or other similar material having a rough but not a rigid surface upon the upright finger, k, for the purpose of holding down the blanks by frictional action and elastic or yielding contact as described, and at the same time allow the top blank to be carried away from the pile by the gum-box above.

Fourth, I claim the form and construction of the gum-box, B, for holding and distributing the gum.

Fifth, I claim the combination of the valves, stems, and rods, with said box, so that by the vertical motion of the box the valves will be made to open and close, in the manner and for the purposes described.

Sixth, I claim the combination of the plate, 13, and the rods and springs with said box, so that by the vertical motion of said box the plate will descend and disengage the envelope blank, as described.

Seventh, I claim the covering of the valve aperture with cloth to prevent the glue spreading or flowing in excess, as described.

45,398.—Pump.—Alfred Duvall, Baltimore, Md.:

I claim, first, Dividing up the face of the pump disk between the main arms, c, into a series of water ways, arranged as and for the purpose described.

Second, I also claim the forming of the face, or of the vanes or ribs upon the face of the disk, of the shape of a frustrum of a flat cone, for the purpose of enlarging the areas of the water ways near the center of the disk and making them of the same or nearly the same areas of that of the discharge issues, substantially as described.

I also claim the arrangement of the projection, g, upon the shield, I, and the flanged ring, h, for the purpose of forming a water packing and a continuous waterway between the inlet and the pump chambers, substantially as described.

45,399.—Animal Trap.—Augustus J. Eddy, Winnesheik County, Iowa; and John B. Wilber, Howard County, Iowa:

We claim the combination of the spring, C, wire, G, lever, H, and trigger, F, constructed and operated as described.

45,400.—Buttons.—Philip W. Gengenbre, Boston, Mass.:

I claim the improved locking mechanism, constructed substantially in manner and so as to operate as described.

45,401.—Buttons.—Philip W. Gengembre, Boston, Mass.:

I claim the arrangement of the spring, f, within the button body and with the jaws, c' c', and the opening, c, thereof, or the equivalent or equivalents therefor, substantially as described.

45,402.—Buttons.—Philip W. Gengembre, Boston, Mass.:

I claim the improved button or button body, as made with the opening or slot, f, and the cross groove or jaws arranged together substantially as and for the purpose of aiding in fixing the button body to a catch, as described.

45,403.—Chimney Top.—A. L. Geserick, St. Louis, Mo.:

I claim a chimney top or cap composed of a main portion, A, and an upper portion, C, the latter being provided with an opening, b, and a partition, a, arranged to form the passages, D D, which communicate with the opening, b, the main part, A, and the external air, substantially as and for the purpose herein set forth.

[This invention relates to a new and useful improvement in chimney caps or tops for the purpose of improving and rendering perfect the draught of chimneys, whether the defect in the same arises from a faulty construction or an unfavorable situation.]

45,404.—Heat Radiator.—Claudius B. Hall, Racine, Wis.:

I claim the radiator consisting of its shell, a, its frame, m, its damper, h, and its collars, b and d, constructed and operating substantially as above described.

[This invention consists in dividing the interior of a heat radiator into segmental divisions, communicating with each other, and combining therewith a horizontal damper which rotates so as to uncover different divisions at pleasure.]

45,405.—Hay-loading Machine.—James T. Hall & Isaac Pierce, Holland Patent, N. Y.:

We claim, first, The spring arms, e e, on collar, J, constructed and applied in the manner and for the purposes as shown and described

Second, The combination with tire bar, U, of the rod, a, arm, Y, and rod, Z, substantially as shown and described.

Third, In combination with the tracks, W X S S S S, the rollers, i i, and T T, as shown and described.

Fourth, The combination of the standard, h, lever, g, and bar, f, or their equivalents, substantially as shown and described.

Fifth, The gathering boards, c c, and dividing rods, d d, in combination with the frame, A, and the elevating apparatus herein described, substantially as and for the purpose set forth.

45,406.—Apparatus for Fermenting Malt Liquors, etc.—Adolph Hammer, New York City:

I claim, first, The employment or use of a body, B, either solid or hollow in combination with a fermenting tub substantially as set forth so that by raising or lowering said body the hight of the fermenting liquid in the tub can be regulated, and the liquid is cleansed without additional labor.

Second, The tub, A, with guide strips, c, and trough, C, in combination with the body, B, either solid or hollow, constructed and operating substantially as and for the purpose described.

45,407.—Passenger Support for City Cars.—James Hanley, New York City:

I claim making straps or hanging supports of passenger cars, to extend and contract, substantially in the manner and for the purpose herein described and set forth.

43,408.—Condenser.—A. Hartupee & H. P. Gengembre, Pittsburgh, Pa.:

We claim, first, The use of the expeller, E' E, arranged in combination with a condenser, A, and operating in place of the ordinary air-pump, in the manner and for the purpose substantially as described.

Second, The float, d, applied in combination with the steam or compressed air-pipe, F, expeller, E E', and condenser, A, in the manner and for the purpose set forth.

[This invention consists in the arrangement in the interior of a condenser of two or more conical pipes placed one over the other so as to leave an annular space between them and applied in combination with a steam or compressed air supply pipe, in such a manner that if by the action of the steam or hot air a current of water is impelled through the conical pipes, the annular space left open at the bottom end of the second tube allows the air in the condenser to be worked up by the water, and the atmospheric air is readily expelled therefrom without the use of an air-pump. The action of the injector, or more properly speaking, expeller, thus obtained is regulated by a float which opens or closes the steam or compressed air supply pipe.]

45,409.—Bread-slicer.—G. W. Hildreth, Lockport, N. Y.:

I claim, first, The vibrating knife, E, with one end hung to a pendant, g, swinging from a standard, f, in combination with the eccentric, J, connecting rod, i, link, k, dog, o, grooved wheel, d, substantially as and for the purpose specified.

Second, I claim the combination of the vibrating knife, connecting rod, and endless apron for producing an automatic feed motion, for the purpose specified.

Third, I claim the eccentric, J, in combination with the connecting rod and knife, to govern the thickness of the slice to be cut, as specified.

45,410.—Medical Compound.—Wm. Horner, Washington, D. C.:

I claim the within described medical composition.

45,411.—Hook and Eye.—Joseph Charles Howells, New York City:

I claim the construction of hooks and eyes for wearing apparel and other uses, substantially as shown and described.

45,412.—Metallic Guard for Water Buckets.—Jacob B. Hyzer, Jamesville, Wis.:

I claim, first, Enclosing a water bucket in a metallic guard, substantially as described.

Second, Constructing a metallic guard for water buckets so as to admit of the removal of the bucket, B, from the guard by taking off the bail thimble, A, as herein described and set forth.

Third, Constructing a metallic guard for a water bucket and adopting it to the bucket, so as to admit of the attachment of the trip bolt, o, to the guard instead of to the bucket proper, substantially as herein described and set forth.

45,413.—Curtain Fixture.—Hubert L. Judd, New Britain, Conn.:

I claim securing the spring, f, by the recesses, i i, in the manner and for the purposes specified.

45,414.—Snap Hook.—Oliver S. Judd, New Britain, Conn.:

I claim the employment of the spirally formed spring, E, in combination with the hook, A, and latch, C, when fitted into properly formed recess inside of said hook and latch, in the manner and for the purpose substantially as described.

45,415.—Smoke House.—Adam S. Kennedy, St. Louis, Mo.:

I claim a movable shield, A, of any form to be interposed between the fire in a smoke house and the meat suspended above the fire, for the purpose of preventing the grease from becoming ignited, substantially as set forth

45,416.—Mowing Machine.—L. G. Kniffen, Worcester, Mass.:

I claim, first, The tube, B, placed loosely on the part, A, and provided with pendants, a a' a'', and a groove, e, to receive the slide, d, of clutch, c, all arranged and combined as herein shown and described.

Second, The toothed segment, Q, and pendant rack, R, attached respectively to the tube, M, and draught pole or the bar, S, thereof and arranged substantially as shown to operate in connection with the lever, U, and chain, v, or their equivalents, for the purposes specified.

Third, The manner of connecting the tube, M, to the tube, B, of the axle as described, to wit, by having a plate, L, attached to the pendants, a' a'', of the tube, B, and flanges, f f, secured to the plate, L, which flanges project over a rim, a, at the inner end of the tube, M, whereby a firm connection of the tube with the axle is obtained and the tube at the same time allowed to turn freely.

Fourth, I claim the arrangement of the connecting rod, G, bent lever, I, and link, J, to the cutter bar, K, in combination with the tube, M, and shoe, N, cast in one piece, as and for the purposes specified.

45,417.—Bedstead Fastening.—Spencer Lewis, Tiffin, Ohio:

I claim, first, The divided expansible dovetail fastening in combination with a bedstead, substantially as and for the purpose described.

Second, I claim the wedge head or foot slat for extending and locking the fastening, substantially as set forth.

Third, The ledges or supporting devices, A A, serving for sustaining the slats and as the main portion of the fastening, substantially as described.

Fourth, The combination of the several devices specified, for the purpose described.

45,418.—Range for Cooking and Heating.—P. W. Mackenzie, Jersey City, N. J.:

I claim, first, The combination in a cooking or heating range of the reservoir, A with the inclined grate, B B', substantially as described.

Second, The combination of the shield or dumping grate, C, with the grate, B, substantially as and for the purpose set forth.

Third, The combination of the apron or plate, I, with the inclined grate, B, for increasing or diminishing the size of the fire, substantially as described.

Fourth, The combination with the inclined grate, B B', and cooking and heating range of the fire pot, T, constructed as described whereby the heat is radiated from all parts of said pot both above and below the plane of the grate, substantially as described.

Fifth, The offence bonnet, N, constructed substantially as described and for the purpose set forth.

Sixth, The neutralizing cover in combination with the reservoir, A, substantially as and for the purpose set forth.

45,419.—Baking Powder.—George A. Mariner and James Fish, Chicago, Ill.:

We claim the preparation as herein described of a baking powder, by the combination of gum arabic, dextrine or other soluble gums or mucilaginous substances with the alkaline bicarbonates and the acids or acid substances, or with any other of the gas generating preparations in common use for such purposes.

45,420.—Priming Metallic Cartridges.—Edward Maynard, Washington, D. C.:

I claim the combination of a wad, B, of any suitable material, with the interior of a cartridge, A, so as to form a firm support for the inner end of a priming tube, D, passing out through the side of said cartridge, substantially in the manner herein set forth.

45,421.—Mode of extracting Tanning Properties from Bark.—James McGeary, Salem, Mass.:

I claim, first, The extraction of tanning properties of barks or other substances by means of steam under pressure.

Second, The extraction of tanning properties of barks in sheets or large pieces without previous grinding or other reduction, substantially as and for the purpose set forth.

Third, The extraction of tanning properties of barks or other substances by means of boiling under pressure in a tight vessel, in the manner substantially as shown and described.

Fourth, Saving the tanning properties contained in the steam which may escape from the boiler or other vessel, by the means described.

45,422.—Sewing Machine.—Gordon McKay, Boston, Mass., and Lyman R. Blake, Quincey, Mass.:

We claim in combination with a mechanism for reciprocating the needle and with the presser foot, means for altering the ratio of the needle stroke to those variations in the position of the presser foot which are caused by changes in the thickness of the stock.

Also the means described for leaving the pressure free to move downward from the lowest positions in which it is left by positive movement of its actuating mechanism.

Also in connection with a mechanism for reciprocating the needle an adjustable device for producing any desired degree of retardation, substantially for the purpose described.

And the construction of the shaft driving the wheel within the horn, with an expansion joint, for the purpose specified.

45,423.—Seeding Machine.—Daniel E. McSherry, Indianapolis, Ind.:

I claim the head or disk, B, in combination with the feed wheel, C, having spiral threads, E, the several parts being constructed as specified and arranged in relation to the seed hopper, as and for the purpose set forth.

45,424.—Seeding Machine.—Daniel E. McSherry, Dayton, Ohio:

I claim, first, The lift bar, A, when constructed as described with loops, C, and hooks, C C, the same being attached to the frame of the machine by means of the suspended arms, E E, and held in its elevated position by means of the support, B, as herein set forth.

Second, I claim the projection, D, on the arm, E, when used in connection with the lifting rod, A, as and for the purpose specified.

45,425.—Heat-radiating Attachment for Flues.—Wm. P. Merrill, of Milwaukie, Wis.:

I claim the attachment of a radiator to a chimney flue combined with a damper, for the purpose of directing the waste heat through the radiator or allowing it to pass directly up the chimney, substantially as described and represented.

[This invention relates to a new and improved radiator applied to a flue or chimney provided with dampers, and all arranged in such manner that the products of combustion which pass up the flue from a stove or fire may, when required, be made to pass through the radiator in an apartment above that containing the stove or flue, thereby economizing in fuel and avoiding the necessity of passing a stovepipe through the floor, which has an unsightly appearance, and which is now done in order to obtain the same end.]

45,426.—Pigment and Vehicle for Mixing Paints.—John M. Merryman, Indianapolis, Ind.:

I claim the white clay paint pigment, and the solution to bichromate of potash in water, prepared and used in the manner and for the purpose, as above described.

45,427.—Plow.—Leander Miller and Hermann Kaller, Camp Point, Ill. Ante-dated Jan. 10, 1863:

I claim, first, The axle, C, provided with the cranks, D D, having the wheels, E E, attached in connection with the lever, F, and stop bar, G, all arranged as and for the purpose herein set forth.

Second, The bar, I, attached to the bar, a, of the frame, A, as shown and secured at the desired hight by the catch, j, and notched segment bar, J, in connection with the adjustable plow beam, K, attached to the bar, I, substantially as and for the purpose herein set forth.

Third, The combination of the adjustable beam, K, bar, I, and adjustable axle, C, all arranged as and for the purpose specified.

[The objects of this invention is to obtain a plow of simple construction which will be free from side draught, capable of being adjusted so as to regulate the pitch of the share as may be desired, and also to elevate it entirely above the surface of the ground when necessary, and also capable of having the wheels on which the frame is mounted adjustable, so that the implement may be kept in a proper horizontal position when at work, with one wheel in the furrow and the other on the unplowed land, or when both wheels are moving over level or unbroken ground.]

45,428.—Instrument for Destroying Caterpillar Nests.—Joseph S. Needham, South Danvers, Mass.:

I claim the implement made, substantially as and for the purpose hereinbefore explained.

45,429.—Damper Regulator.—William Noyes, New York City:

First, I claim the combination and arrangement of the semi-spherical piston, H, the piston ring, I, the piston rests, T T T, the tapering hole in the top of the piston, H, combined with the anti-friction, anti-corrosive metallic cylinder lining, B, the elastic packing ring, G, and the fulcrum pin, J, or their equivalents, for the purposes set forth and therein described.

Second, I claim the combination and arrangement of the angular notches, U U, in the cylinder ears, O O, the points or ears on the fulcrum pin, J, combined with the lever pin, N, the deep angular notch in the fulcrum, K, and the set screw, L, or the equivalents, for the purposes set forth and herein described.

45,430.—Fruit Ladder.—E. F. Olds, South Lyons, Mich.:

I claim, first, The adjustable table, D, with cleats, E F, in combination with the ladder and braces, G, as and for the purpose set forth, substantially.

Second, I claim the special arrangement of the adjustable braces, T, and jointed together in combination with the jointed sections, A B, when constructed and operating conjointly as and for the purpose set forth, substantially.

45,431.—Washing Machine.—J. W. Parker, St. Charles, Ill.:

I claim the radial arms, b, attached to the vertical shaft, C, and provided with the vertical fluted rollers, H, all arranged with the suds box or tub, A, substantially as and for the purpose herein set forth.

45,432.—Cooking Stove.—Moses Pond, Boston, Mass.:

I claim the improved stove as made with the air-heating chamber arranged around the front, the rear and the ends of the fire pot or fire-place and in the fire proof lining thereof, such chamber opening into the atmosphere and the oven, substantially in manner as described.

I also claim the combination and arrangement of the slanting arched plate, k, with the flue plates, H and g, arranged with the oven and bottom plate of the stove, substantially as specified.

45,433.—Sorghum Juice Evaporator.—D. J. Powers, Madison, Wis.: Ante-dated Nov. 30, 1864:

I claim the arrangement of a series of movable close partitions, E F, in an elongated pan or division, A B, thereof, acting also as scrapers, to move the sirup forward, whereby the evaporation is conducted to any desired extent and with any degree of rapidity, the process being under perfect control, substantially as herein specified.

I also claim, in combination with the movable close partitions, E F, arranged in double pans or divisions, A B, the arrangement of the dampers, i j, minutely adjustable to different positions to regulate the flues respectively under said pans or divisions, so as to hasten or retard the evaporation, at the earlier or advanced stages, with the utmost exactness, substantially as herein specified.

45,434.—Sad Iron.—E. L. Pratt, Boston, Mass.:

I claim the application of an arming or rest piece to the handle of a sad iron, to operate substantially as described.

I also claim so applying the handle that the extent of its rocking movement can be regulated and adjusted, substantially as set forth.

45,435.—Drawer or Till Alarm.—F. H. Purrington, Willimantic, Conn.:

I claim, first, the vertically sliding bolt, Q, in combination with a series of tumblers, L, arranged with springs and notches, in the manner substantially as shown, to operate in connection with a bell alarm and stop, I, for the purpose specified.

Second, The pendent, J, provided with the two inclined flanges, f f', in combination with the lateral projection, n, on the bolt, q, substantially as and for the purpose set forth.

Third, The notches, m k l, in the tumblers, L, in connection with the catch rod, t, and the plate, R, all arranged as and for the purpose specified.

45,436.—Machine for Registering Measured Grain.—Albert Rakestraw and Wm. Colwell, Chilicothe, Ill.:

I claim the revolving box, B, placed on or attached to the shaft, A, in combination with the tapped, E, and wheels or registers, F G H, all arranged substantially as and for the purpose herein set forth.

45,437.—Steam Trap.—Charles B. Richards, Hartford, Conn.:

I claim the employment, in combination with the discharge valve of a steam trap, and the float by which it is actuated, of a counterpoising weight, or an equivalent therefor, so connected with the said

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float as to render it more buoyant, substantially in the manner hereinbefore clearly set forth.

45,438.—Rain Spout.—Francis P. Rogers, Philadelphia, Pa.:

I claim the supplementary spout, B, in combination with the main spout, A, the same being constructed and applied so as to operate together, substantially in the manner described for the purpose specified.

45,439.—Horse Hay Fork.—Edgar D. Rundell, Hudson, N. Y. :

I claim employing in hay elevators a rest, or its equivalent, with the load discharging rope, lever or other device, substantially as and for the purpose set forth.

45,440.—Reducing Straw and other Fibrous Substances for the Manufacture of Paper Pulp.—Rebecca Sherwood, Fort Edward, N. Y. :

I claim, first, The use or uses of the soapy solution prepared as herein described, in combination with any ingredient or ingredients which will combine with either in a heated state in a solution and reduce straw or any other fibrous substance to a pulp, for the purpose of being converted into colored or colorless paper, commonly known as white paper.

Second, In the use or uses of the above-named different and described soapy solutions, for reducing straw or other fibrous substances to a pulp previous, and for the purpose of being used or manufactured into colored or white paper.

Third, I claim the use of combining a portion of the residence or waste liquid drawn off from a previous boiling (treated or not as previously described) with a sufficient portion of a new soapy solution, as previously described, for a new boiling of straw or other fibrous substance.

45,441.—Composition for Preserving Fruit Trees.—Lysias Smith, Gorsuch's Mills, Md. :

I claim the use of the within described composition for preventing the ravages of insects upon fruit or other trees, as described.

I also claim the application of the composition above named to the roots of trees by or through the intervention of a cloth or wrapping around the roots of the trees, and at or near the surface of the surrounding soil, substantially as and for the purpose herein described.

45,442.—Latch for Railroad Car Doors.—John Stephenson, New York City :

I claim, as a new article of manufacture, the door fastening hereinbefore described, consisting of the hooked latch, B, and two handles, D D, rigidly secured upon and connected by the arbor, C, the casing, A, spring, E, and catch, F, all constructed and employed, as specified.

45,443.—Lamp Burner.—Cornelius St. John, Boston, Mass. :

I claim the combination of the self-adjusting clasp composed of the curved bars, d d, and the curved guiding rolls, c, with the cone, B, and burner, A, in the manner herein shown and described.

45,444.—Cheese Press.—La Cortes Tanney, Olmstead, Ohio :

I claim the arrangement of the arms, C and D, sheaves, c and d, in combination with cords, h p and p', and levers, H and P, when operating conjointly as and for the purpose set forth.

45,445.—Derrick.—Seth Turner, Onarga, Ill. :

I claim the rotating shaft, B, provided with the oblique arm, G, and fitted in the framing, A, as shown, in combination with the adjustable arm, J, and the rod or catch, D, and the notched ferrule, C, or their equivalents, for securing the shaft, B, all arranged and used in connection with a horse hay-fork and tackle, substantially as and for the purpose set forth.

[This invention relates to a new derrick, arranged in such a manner that it may revolve, and provided with a fork, tackle, spring and guide, whereby the hay or grain may be elevated to any desired hight and then swung around over the stack, rick, cart or mow, and discharged, and the empty fork then lowered to be again loaded, elevated and discharged.]

45,446.—Nut-making Machine.—Lewis Weckesser, New Haven, Conn. :

I claim, first, The lever, K, arranged relatively with the cutter, H, and to operate in connection therewith, substantially as shown, for the purpose of rendering the blanks uniform in size, as set forth.

[Second, The securing of the rod or shover, G, in its slide, E, by means of the spring, c, and pin, b, substantially as shown, to admit of the rod or shover, in case of the latter meeting with any resistance in its work, becoming disengaged from the slide, as herein described.

Third, The spiral passages, j j*, for the purpose of turning the nuts respectively from a flatwise to an edgewise position, and vice versa, as described.

Fourth, The adjustable bar, m, forming the bottom of the chamber, l, and of less width than the same, to admit of the escape of scales, dirt, etc., therefrom, as set forth.

Fifth, The combination of the punch, L, and box, r, to insure the central punching of the blank, as specified.

Sixth, The horizontal intermittingly rotating wheels, S, provided with a series of radical arbors, R, to receive the blanks, and turn the same so that its several sides will be consecutively acted upon by the hammer, A', substantially as set forth.

Seventh, The plates, h*, at the end of the slide, C', for the purpose of drawing the forged blanks from the arbors, R, as set forth.

Eighth, The wheels, z z', provided respectively with the teeth, f*, and projections, g*, in connection with the spur wheels or wipers, u, and the collars, v, in the arbors, R, for the purpose of raising and rotating the arbors to admit of the sides of the blanks being forged consecutively, as described.

[This invention consists in a novel and simple device for gaging the bar from which the blanks are cut previous to the cutting off of each blank from the bar, so as to insure the blanks being of the same size or of uniform dimensions. The invention also consists in the peculiar construction and arrangement of parts whereby the whole operation of punching and forging the blanks is brought within a very limited space, and a very simple device is obtained for the desired purpose and one possessing a number of advantages.]

45,447.—Fan Power.—W. E. Wilcox, St. Louis, Mo., assignor to himself and Bernard F. Myers :

I claim, first, The application of a friction brake to a balance wheel, which is keyed to a spindle receiving its motion from a train of wheel work, substantially as and for the purposes described.

Second, The combination of a spring, F, friction wheel, g, and an adjusting screw, p, with a balance wheel, E, and fan, D, substantially as described.

45,448.—Washing Machine.—J. B. Winchell, Chicago, Ill.:

I claim, first, The application of an oscillating bed of rubbers, g, to a cylinder, E, substantially as described.

Second, The rolling drum, H, applied and operating in conjunction with the oscillating bed of rollers and cylinder, E, substantially as described.

The arrangement of means, substantially as described, for reciprocating a series of yielding rollers or rubbers, and turning a cylinder, as set forth.

45,449.—Apparatus for Producing Scenic Effects.—William Calcott, London, Eng.:

I claim the combination of a sheet or sheets of glass painted in transparent colors covered in front with painted network and having a light backing, as hereinbefore described.

45,450.—Car Propeller.—Phillip Wm. Phillips, Bristol, Eng. :

I claim the combination of the "travelers" with a rail or rails applied and operating substantially as and for the purpose set forth.

Also the chain of levers attached to or acted upon by any motive power in combination with the travelers, constructed and operating substantially as and for the purpose described.

45,451.—Self-feeding Tobacco Cutter.—Richard Smith, Sherbrooke, Canada :

I claim the applying to a hand-cutting tobacco machine of a feed mechanism constructed or composed of a toothed plate, G, operated from the knife gate, E, which is moved through the medium of the C, all arranged in the manner substantially as set forth.

45,452.—Machine for Tapping Bolts.—F. Watkins, London Works, Birmingham, Eng. :

I claim, first, The arrangement of the levers, weights and pedals, substantially as herein described, for the purpose of reversing the motion of the machine.

Second, The griping device constructed as herein described and shown, for holding round-headed bolts and stud ends.

Third, The hollow stationary axle in combination with the fast-pulley connected firmly to the hubs of the bevel wheels and with the loose pulley running loosely on said axle, substantially as and for the purpose specified.

Fourth, The yielding cutting device arranged substantially as herein set forth for the purpose of cutting or chamfering the ends of the bolts during the process of threading.

[This invention consists in the arrangement and combination of two machines in one frame constructed so that both may be used for either screwing bolts or tapping nuts, or one used for screwing bolts and the other, at the same time, for tapping nuts, and the entire mechanism can be easily attended to by one or more operators.]

45,453.—Signal Tower.—B. P. Lamason (assignor to himself and Sidney D. King), Alexandria, Va. :

First, I claim the extensible and contracting frames, C c, employed in combination with the connecting platforms, D, and movable sills, E, the whole being constructed and arranged to operate in the manner herein set forth.

In combination with the above, I claim the right and left screw, F, and crank, H, together with the shaft, I, and gears, J J, when arranged to operate in the manner and for the purpose herein described.

45,444.—Device for Plowing in Stubble.—Josiah Kilmer (assignor to himself and Augustus Kilmer), Cobleskill, N. Y.:

I claim the application to a plow beam, B, and double tree, G, of a drag chain, A, substantially in the manner and for the purpose set forth.

45,455.—Engine Turning Lathe.—Charles W. Dickinson (assignor to himself and Geo. Rowden), Newark, N. J. :

I claim, first, The combination of the sliding cams, n, adjustable frame, e, and tool plate, 10, substantially as and for the purpose set forth.

Second, The combination of the eccentric, Q, the adjustable frame, e, and the shaft, O, substantially as hereinabove set forth.

Third, The combination of the eccentric, Q, one or more of the cams, n, or their equivalent, and the vibrating frame, e, and connecting parts or equivalent device for combining the motions by the eccentric and the cams and transmitting the same to the engraving tool.

Fourth, The combination of the engraving tool, 5, the gage, 7, the bell crank, 29, or its equivalent, and the eccentric, Q, substantially as and for the purpose hereinbefore stated.

Fifth, The combination of the engraving tool, 5, the gage, 7, the bell crank, 29, or its equivalent, and one or more of the cams, n, connected as described, or its manner equivalent, substantially as and for the purpose set forth.

Sixth, The combination of the cams, n, or any two or more of them, the adjustable stops or touches, l, or any two or more of them, and the slide, k, and the latter is connected to the engraving tool, substantially as described, to the effect hereinabove stated.

Seventh, The arrangement with the connecting shafts, H and I, or equivalent, and with the engraving tool and the face-plate, or its equivalent, on which the work is to be mounted, of the doubling clutch, 21, 22 and 23, substantially as and for the purpose described.

Eighth, The arrangement in the engraving tool, 5, platform, 4, eccentric, Q, and cams, n, or equivalent device, the parts being connected substantially as and to the effect stated above.

Ninth, The combination of the frame, e, platform, 4, one or more of the adjustable bearings, e and f, and one or more of the vibrating arms, b and g, or equivalent, for modifying the motions to be imparted to the engraving tool, substantially as set forth.

Tenth, So constructing the adjustable bearings, e or f, and either of them, and so combining therewith the frame, e, and the armed shafts, a and h, or either of them that the motion given to one of the said shafts may be neutralized upon the frame, e, substantially as set forth.

45,456.—Apparatus for Carburetting Air.—Hugh L. McAvoy (assignor to himself and Elias S. Hutchinson), Baltimore, Md. :

First, I claim carburetting air by means of a revolving volute wheel, B B', operating within a vessel or reservoir, A, substantially as described.

Second, I claim the use of the journal, D, made smaller than its bearing, D', to permit the oil to be returned from the gas chambers, E, to the vessel, A, as herein set forth.

Third, I claim the employment in connection with the vessel, A, and wheel, B, of a valve, H, adapted automatically open, when the apparatus is in operation for the purpose of supplying air to be carburreted, and to close when the operation is suspended, in order to prevent the oil from evaporating as explained.

Fourth, I claim the hollow shaft, C, having perforations, c, and communicating with the gas chamber, E, and vessel, A, so as to constitute a medium for returning the oil from the chamber, E, to the vessel, A.

Fifth, As means for returning the oil from the chamber, E, to vessel, A, and to be especially available when such oil is in excess, I claim the pipe, F, arranged and employed in the manner described.

45,457.—Wood-bending Machine.—James N. Ray (assignor to himself and John M. Wheatly), of Indianapolis, Ind. :

First, In a wood-bending machine I claim the flexible groove formed by fixing upon the face of a plain strap of flexible metal two rows of segments of any suitable material, so shaped as to form the walls of the groove, whilst the strap itself forms the bottom thereof, substantially as herein set forth.

Second, I claim the combined use of the bending strap and back strap, substantially as herein set forth.

Third, I claim the combined use of the clip, the perforated back strap, the rod, G, the clamp and the wedge, as a means of holding the bent handle until it is cool and firmly set, substantially as herein set forth.

Fourth, I claim the forms, E, when attached to the head, F, and used to tread upon the segments or upon the strap outside the segments, substantially as herein set forth.

Fifth, I claim the wrists, I I, in combination with the forms, E, when used to make said forms move horizontally, and to prevent them from rising from the bench in the act of bending, substantially as herein set forth.

Sixth, I claim the combined uses of the head, F, the forms, E, and the follower, D, substantially as herein set forth.

45,458.—Clothes Pin.—Henry W. Sargeant (assignor to himself and G. Brayton Johnson), Boston, Mass. :

I claim constructing a clothes pin with two rigid outside prongs, b b, and a flexible tongue, C, between them, substantially as set forth and for the purpose described.

45,459.—Screw Plate.—James Smith (assignor to himself and Major Smith), New Haven, Conn. :

I claim the herein described screw plate constructed and operating substantially as and for the purpose specified.

45,460.—Manufacture of Coal Gas for Illumination.—J. W. Smith (assignor to himself and Jonas Greene), Washington, D. C. Ante-dated Oct. 17, 1863 :

I claim making coal gas by charging the retort with coal and heating in the usual way for two hours, and at the end of this time supplying the gas tar thus far made in the operation through reservoir, B, substantially in the manner and for the purpose set forth.

45,461.—Printing Press.—Franklin L. Bailey, Boston, Mass. :

I claim, first, The application of one or more movable slides or tables, to the cylinder, C, for the purpose described, when these movable tables constitute a part of the distributing surface over which the rollers, r r, roll and spread ink.

Second, I claim the means of effecting the movement of these tables, I I, the same being the gear, 4, and gear, 5, connection, 6, and forked lever, 7, substantially as described.

Third, I claim the combination of the dogs, D D, with the cylinder, when such dogs are made to close with the cylinder by the same means that raises or uncloses them, for the purpose described.

Fourth, I claim the combination of the connections, c c, and joints, w' w', with the swivels, E E, when these swivels are made to vibrate on their axes, e' e', and fold the connections, c c, down on to them for the purpose above set forth.

Fifth, I claim the herein described method of vibrating the swivels, E E, by means of the sub-connections, c' c', and their shaft, g.

45,462.—Sub-caliber Rifled Projectile.—J. L. Henry, of the State of Kentucky :

First, I claim so combining with a projectile a metallic sabot so as to cause it to fly off on leaving the gun by a force other than the action of the atmosphere alone, substantially as described.

Second, Securing the sabot to the shot by a device which shall be broken or destroyed on firing, thereby leaving the sabot free to drop from the projectile after leaving the gun, substantially as described.

Third, The combination of a ring, H, with the disk of a sabot or base of a projectile, for the purposes and substantially as set forth.

45,463.—Ejector for Oil Wells.—J. D. Angier and Frederick Crocker, Titusville, Pa. :

We claim the employment of the deflector in combination with the two tubes and annular projection, substantially as described for the purpose set forth.

45,464.—Ejector for Oil Wells.—Geo. M. Mowbray (assignor to J. D. Angier and F. Crocker), Titusville, Pa. :

I claim the employment, in combination with the blast tube and deflector, of an adjustable bulb, or its equivalent, substantially as described and for the purpose set forth.

RE-ISSUE.

1,833.—Process of Treating Steel to render it Tougher, Stronger and more Elastic.—William Hazen, Milwaukie, Wis. Patented Sept. 20, 1864 :

I claim, first, The treatment of steel so as to render the same tougher, stronger and more elastic by immersion in a bath or solution of combined chemical agencies, substantially as described and for the purpose set forth.

Second, The process of treating steel by the combination of aqua ammonia, sulphate of iron and salammoniac in solution, substantially as described and for the purpose set forth.

DESIGNS.

2,006.—Cook's Stove.—E. J. Cridge, Troy, N. Y.

2,007.—Lable of a Mustard Box.—Samuel Crump, Jr., (assignor to Beards & Cummings), New York City.

2,008 to 2,012.—Carpet Patterns.—Elemir J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass. (Five cases.)

2,013 to 2,015.—Stove plates.—Nicholas S. Vedder, Troy, N. Y. (Three cases.)

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, Dec. 7, 1864, to Wednesday, Dec. 14, 1864:—

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